



## United States Department of the Interior

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**In reply refer to:**

AESO/SE  
02EAAZ00-2019-F-1018

May 7, 2020

Karla S. Petty  
Division Administrator, Arizona Division  
Federal Highway Administration  
4000 North Central Avenue, Suite 1500  
Phoenix, Arizona 85012-3500

RE: Verde Connect Project  
FHWA File # YYV-0(209)Z

Dear Ms. Petty:

Thank you for your request for formal consultation/conference with the U.S. Fish and Wildlife Service (FWS) pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544), as amended (Act). We received your request via electronic mail (email) on November 25, 2019, along with the biological assessment (BA) for the project, dated November 2019. The Federal Highway Administration (FHWA) is the lead federal agency for this project, which also includes project associated actions by the Army Corps of Engineers (ACOE) (404 permitting); and U.S. Forest Service (USFS) (Forest Plan updates including right-of-way [ROW]) addressed by this consultation. At issue are effects that may result from the proposed "Verde Connect" roadway and bridge across the Verde River, in Yavapai County, Arizona.

You determined, following our input and changes to proposed rules (see Consultation History), that the proposed action "may affect, and is likely to adversely affect" the endangered southwestern willow flycatcher (*Empidonax traillii extimus*) (flycatcher), threatened western yellow-billed cuckoo (*Coccyzus americanus*) (cuckoo), and threatened northern Mexican gartersnake (*Thamnophis eques megalops*). You also concluded the proposed action "may affect, and is likely to adversely affect" flycatcher designated critical habitat, and proposed critical habitat for the northern Mexican gartersnake and cuckoo.

In addition, you determined that the proposed action "may affect, but is not likely to adversely affect" the narrow-headed gartersnake (*Thamnophis rufipunctatus*), threatened Mexican spotted owl (*Stix occidentalis lucida*) (owl), and three endangered fish species and their designated critical habitats: razorback sucker (*Xyrauchen texanus*) (sucker), spikedace (*Meda fulgida*), and loach minnow (*Tiaroga cobitis*).

You also determined that the proposed action would have “no effect” on the Arizona cliffrose (*Purshia subintegra*), Gila chub (*Gila intermedia*), woundfin (*Plagopterus argentissimus*), and narrow-headed gartersnake proposed critical habitat. No effect determinations do not require our review and are not addressed further.

This biological opinion and conference opinion is based on information provided in the November 2019 and January 2020 BAs, subsequent BA addendums, telephone conversations, field investigations, and other sources of information. Literature cited in this biological and conference opinion is not a complete bibliography of all literature available on the species of concern, effects of road and bridge construction, or on other subjects considered in this opinion. A complete record of this consultation is on file at this office.

### **Consultation History**

November 25, 2019	We received your BA and request for formal and informal consultation and conference for the project.
December 18, 2019	We sent you our review of the BA.
December 19, 2019	We sent a 30-day letter indicating that all information required to initiate consultation was in the BA or otherwise available for our reference.
January 21, 2020	We received your revised BA, dated January 17, 2020, incorporating our guidance on conservation measures. You also changed your determination for the Arizona cliffrose from “may affect, not likely to adversely affect,” to “no effect,” and your narrow-headed gartersnake determination from “likely to adversely affect,” to “not likely to adversely affect.”
February 7, 2020	You sent an erratum to the BA correcting acreages for permanent vegetation removal caused by bridge piers.
February 27, 2020	We published a proposed yellow-billed cuckoo critical habitat revision (85 FR 11458). Yellow-billed cuckoo proposed critical habitat now is within the Verde Connect action area.
April 17, 2020	We received an addendum to the January 17, 2020, revised BA that included an evaluation of potential effects to proposed western yellow-billed cuckoo critical habitat, and an updated formal consultation request adding cuckoo proposed critical habitat to the request.
April 21, 2020	We received your addendum to the revised BA in which you changed your Mexican spotted owl determination from “no effect” to “may effect, is not likely to adversely affect,” and requested our concurrence.
April 24, 2020	We sent you our draft BO.

April 28, 2020

We received your comments on the draft BO. On this date, we also revised our proposed rule on northern Mexican gartersnake and narrow-headed gartersnake critical habitat (85 FR 23608). Under the revised proposed rule, the action area does not fall within proposed critical habitat for the narrow-headed gartersnake. Accordingly, you changed your determination for narrow-headed gartersnake proposed critical habitat from “likely to adversely affect” to “no effect.”

## BIOLOGICAL AND CONFERENCE OPINION

### DESCRIPTION OF THE PROPOSED ACTION

Regulations implementing the Act (50 CFR 402.02) define “action” as all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by federal agencies of the United States or upon the high seas.

FHWA, as the lead federal agency (ACOE and USFS are participants) and Yavapai County as the project sponsor, are proposing to construct a new 7.1-mile-long roadway, called Verde Connect. The Verde Connect project purpose is to reduce out-of-direction travel, meet current and future growth and development needs, and improve emergency response times in the Verde Valley between the cities of Camp Verde, Cottonwood, and other rural communities. The proposed roadway will extend from SR 260, at the Coury Road roundabout, east to the intersection of Cornville Road and Beaverhead Flat Road (Figure 1). The new road will include a bridge that crosses the Verde River 1.25 miles east of SR 260. The new bridge will span a shallow canyon (hereafter the Verde River Canyon) approximately 80 feet above the Verde River (Figure 2). About 0.6 mile east of the Verde River, the Verde Connect roadway will branch to the southeast to connect with Middle Verde Road—an existing county road that dead ends southeast of the proposed bridge crossing. Hereafter, we will refer to the 1.1-mile branch as the MVR Connector. FHWA retains discretion over the project during its construction, but once completed Yavapai County becomes responsible for its operation and maintenance (R. Yedlin, FHWA, personal communication).

### Definitions

We use the term *construction footprint* to describe areas within the affected environment where permanent and temporary surface disturbances will occur. The construction footprint for the Verde Connect project is the roadway connecting SR 260 and Cornville Road, new bridge over the Verde River, MVR Connector road, new access roads, and staging areas. The construction footprint will also extend laterally from the roadways to accommodate its development. For example, the construction footprint will extend laterally 100 feet north and 100 feet south of the proposed bridge alignment and bridge approaches. The proposed bridge (slightly over 900 feet) plus the bridge approaches (50 feet on each end; see definition below) is a total length of 1,000 feet (Figure 2). All bridge construction activity (geotechnical tests, pre-construction access and staging, bridge construction, and post-construction site restoration) will occur within a 4.6-acre (1,000 x 200-foot) area.

In this BO, we use the term floodplain, to mean the *100-year floodplain* as defined by the Federal Emergency Management Agency (FEMA) (<https://www.fema.gov/national-flood-insurance-program>). A 100-year flood is one having a one percent chance of being exceeded in magnitude in any given year, and a 100-year floodplain is the area inundated by that flood. We examined FEMA flood insurance rate maps (FIRMs) for the action area to determine the width of the 100-year floodplain at the proposed bridge crossing. We also measured the floodplain using the ruler feature in Google Earth. In both cases, the 100-year floodplain measured approximately 600 feet in width (Figure 3), including the floodplain terraces on each side of the

canyon which are elevated slightly above the canyon floor). Thus, the overlap of the construction footprint and Verde River 100-year floodplain is 2.7 acres (600 feet x 200 feet).

For our purposes, we will also refer to the *floodplain margins and bridge approaches*. The floodplain margins are the embankments (slopes) above the floodplain terraces up to and including the bridge abutment on each side of the river. The floodplain margins encompass approximately 1.4 acres (150 feet x 200 feet x 2, or 0.7 acres on each side of the river). Paved bridge approaches will link the new Verde Connect roadway with the new bridge. The approaches will encompass 0.46 acre (50 feet x 200 feet x 2, or 0.23 acres on each end).

Finally, we use the term *action area* to describe all areas of the environment the project may affect, extending out from and including the construction footprint. Typically, the action area is the total area included in our effects analysis; however, the term also has a statutory definition we provide in a later section.

## **Landownership**

Coconino National Forest (CNF) administers most lands east of the Verde River, including the MVR Connector (Figure 1). The Arizona State Lands Department (ASLD) manages most lands west of the river with the exception of a small Prescott National Forest (PNF) parcel at the bridge and ADOT ROW at the Verde Connect roadway western terminus (SR 260).

## **Scope of Work**

The Verde Connect project will occur in four steps, three of which (the two roadways and bridge) will run concurrently:

- Geotechnical investigations.
- Construction of a 7.1-mile-long roadway from SR 260 to Cornville Road (Verde Connect).
- Construction of a 1.1-mile-long connection east of the river between Verde Connect and Middle Verde Road (the MVR Connector).
- Construction of a new bridge across the Verde River.

Construction of the Verde Connect and MVR Connector may be done in two phases due to funding. The first phase would extend from SR 260 to the MVR Connector and include the MVR Connector. The second phase would begin at the Verde Connect/MVR Connector intersection and end at Cornville Road.

Geotechnical investigations will occur prior to construction activities. Preliminary test borings at the proposed bridge crossing and at a few locations along proposed roadways will occur during summer 2020. Additional geotechnical test borings would be completed during final design. Yavapai County expects to procure a design-builder with design/construction on the Verde Connect roadway, bridge over the Verde River, and MVR Connector to begin in the fall of 2021 and to end in early 2023 with the opening of Verde Connect, the MVR Connector, and new bridge to traffic. Road construction will begin ahead of bridge construction to allow road crews

time to provide access to the bridge construction site. Road and bridge construction will then proceed concurrently until both are completed.

### Geotechnical Investigations

Three preliminary test borings at the bridge will provide the data needed to finalize bridge pier and abutment designs. The preliminary test borings will include one in the floodplain and two above the floodplain at the bridge abutments. A full geotechnical investigation will follow during final design to support roadway pavement design and construction. Full geotechnical work will include test borings at various locations along the Verde Connect roadway and MVR Connector alignments. In all cases, the geotechnical engineer will use a truck-mounted drill rig to drill auger holes. Work crews will avoid springs, seeps, streams, and other wetlands to the extent possible during geotechnical work, and will place the drill rig on rubber mats for any borings done near wetlands. Approximately 0.02 acre (30 feet x 30 feet) of vegetation clearing and surface disturbance will occur at each boring location. The geotechnical engineer will plug test holes with native materials or cement/bentonite mixture and cap them as needed with small amounts of concrete.

### Access, Staging, and Equipment in the Floodplain

The geotechnical engineer will access the proposed bridge crossing via existing dirt roads on both sides of the Verde River. To access the test site on the floodplain, work crews may use one of these roads, some of which descend into the floodplain. Alternatively, during final design and construction the contractor will construct a temporary access road into the floodplain to conduct the geotechnical test, and will leave the road in place for use during bridge construction.

When road construction begins in the fall of 2021, crews will clear vegetation from the proposed build corridors and establish the subgrade to provide access to the bridge construction site from two directions—from the west via SR 260 and the Verde Connect alignment, and from the southeast via the MVR Connector. Access roads for bridge construction will be 20 feet wide and aligned along the centerlines of the future finished roadways. Some excavating, grading, and fill will likely be necessary to create the subgrades. To access the floodplain during bridge construction, the contractor will construct a temporary access road from the east abutment down to the riverbed (if not done during the geotechnical investigation), by contouring down the floodplain embankment. This will be the only access road into the floodplain and will need to accommodate flatbed trucks, cranes, drill rigs excavators, and other heavy equipment.

Work crews will establish staging and stockpiling areas on the floodplain inside the construction footprint, and may need staging areas above the floodplain to support work on each of the bridge abutments and bridge approaches. Earthwork associated with these activities will require containment systems, dust and spill controls, erosion control measures, and other conservation measures as described in a later section of this BO.

### Temporary Bridge

The contractor will install a temporary bridge on the floodplain across the low-flow channel to permit movement of work crews, equipment, and materials during construction. The bridge will

sit above the river channel on temporary abutments made of large precast concrete beams set back from the channel. Crews will pack native floodplain material on the channel side of each abutment as fill. Planners will design the temporary bridge to be dropped onto its foundations with a crane or large front-end loader, and lifted quickly from the floodplain in the event of high flows.

### Berms

Construction adjacent to the Verde River's active low-flow channel will require earthen berms to protect the work areas and equipment during overbank flows. The contractor will construct two berms from native floodplain material, one on each side of the active channel (Figure 4). The berms will be approximately 3 feet high and 10 feet wide. On the east side of the channel the berm will be approximately 275 feet long, and on the west side approximately 520 feet long.

### Bridge Construction

The new bridge will span the Verde River with five single- or double-column, cast-in-place piers arranged so that no piers are in the active river channel. The bridge will be 907 feet long, with six 150-foot-long precast spans. Its width (64 to 67 feet wide) will be sufficient to include one 12-foot-wide vehicle travel lane in each direction and a multimodal shoulder at the time of construction, and two travel lanes and a multimodal shoulder in each direction at a future date. Bridge height above the active channel will be a minimum of 80 feet.

Bridge construction will take up to 9 months and will begin in early April 2022 with the drilling of pier shafts. Three piers will be on the floodplain and two will be above the floodplain on the floodplain margins (Figure 2). To the extent feasible, the contractor will phase pier construction on the floodplain to occur when flows are lower and the area around the pier is dry. The proposed bridge design will utilize drilled shafts sized so that additional scour protection such as concrete aprons or riprap will not be required. Verde Connect planners anticipate that all stages of pier construction—drilling shafts, placing steel reinforcing cages, and pouring concrete—can be accomplished through standing groundwater by using a concrete pump and tremie (a watertight pipe used to avoid washout of cement when pouring concrete underwater). Work crews will contain water expelled during the process and will not allow it to enter the flowing Verde River.

Piers may have one column approximately 10 feet in diameter or two columns approximately 8 feet in diameter and would be cast in place. Yavapai County anticipates that piers will be in place by September 2022. Crews will construct abutments and wingwalls, place girders, and pour the decks from September to December 2022. Placement of new girders will likely require two cranes. Crews may place crane pads inside and outside the floodplain, but will not place them within the low-flow channel.

### Bridge Approaches

To construct bridge approaches, crews will clear vegetation at each end of the bridge and use dozers and graders to create an even road surface. Crews will then haul aggregate base to the construction sites, add the aggregate in layers to create the road subgrade, compact each layer

with mechanical drum rollers, and finally overlay the asphaltic concrete surface. In most places along the Verde Connect roadway, the road will have one 12-foot-wide travel lane and a paved 8-foot-wide multimodal shoulder in each direction, for a total width of 40 feet. The MVR Connector will have a reduced 2-foot paved shoulder but would be graded to provide the full 8-foot shoulder width to match the geometrics and community character of the existing Middle Verde Road.

### Vegetation Removal

Construction of the new bridge will require vegetation removal, grading, and other surface disturbances within approximately 4.6 acres of the Verde River floodplain, the floodplain margins, and bridge approaches. A proportion of the vegetation removed will be permanent and result directly from bridge construction. Up to 0.007 acre of riparian woodlands will be lost to bridge piers in the floodplain (estimate from the BA), and work crews will permanently remove up to 0.25 acre of upland (semidesert grassland) vegetation to accommodate paving of the bridge approaches and construction of permanent bridge supports (the east and west abutments, wingwalls and two piers—our estimates). Thus, no more than 0.26 acre of permanent vegetation loss will occur at the bridge portion of the project.

Most vegetation removal and floodplain surface alterations will occur during the run-up to bridge construction in February and March 2022, when work crews will establish temporary work areas and facilities needed during construction. These actions will require grading and leveling to some extent and removal of most vegetative cover. Construction of 800 feet of earthen berms alone will require heavy equipment operations within up to 1 acre of the floodplain, and the likely removal of 0.7-0.8 acre of cottonwood and willow woodlands along the Verde River's active channel (our estimate). We estimate that preconstruction activities and temporary facilities will affect up to 2 acres of the floodplain and its riparian vegetation; however, most or all of the affected vegetation will recover after construction through natural regrowth and planned restoration efforts.

### Project Summary and Schedule

Summer 2020	Conduct preliminary geotechnical tests.
Fall 2021	Clear vegetation and lay and compact subgrade from the roadway alignment start points (SR 260 and the Middle Verde Road dead end) to the bridge construction site. Construct a temporary access road into the floodplain (if not done during geotechnical tests).
February 2022	Clear vegetation from the floodplain and proposed bridge crossing.
March 2022	Construct a temporary bridge, earthen berms, and other facilities needed for bridge construction.
April 2022	Begin drilling bridge pier shafts.



September 2022	Finish road construction, including right-of-way (ROW) fencing, guardrails, and road striping. Finish bridge piers. Begin work on bridge abutments and superstructure.
November 2022	Pave bridge approaches.
December 2022	Finish work on the bridge superstructure. Connect the bridge to its approaches. Begin restoration and revegetation of the bridge construction site.
January 2023	Finish bridge site restoration. Open all new facilities to the public.

### **Applicable Design Standards and Best Management Practices**

FHWAs proposed design standards and best management practices (BMPs) are to help avoid negative effects to soils and water quality during construction

- Before ground-disturbing activities occur within 0.5 mile of the Verde River, Yavapai County will develop plans for erosion and sediment control, stormwater management, stormwater pollution prevention, and spill prevention and containment. FHWA and Yavapai County will assure full implementation of these plans at all stages of construction.
- The erosion and sediment control plan will specify measures to minimize discharge of sediments into the Verde River during or after construction using approved wattles, silt fences, hay bales, sediment basins, berms, and other sediment control measures. Work crews will regularly inspect erosion-control measures and products to assure proper function.
- A spill prevention and containment plan will describe measures to prevent pollutants such as fuel, oil, fresh concrete, raw sewage, muddy water, chemicals, construction debris, and other harmful materials from entering the Verde River's active channel or floodplain. The plan will also specify appropriate actions the contractor will take if a spill occurs. Prevention measures will include a containment system on the bridge to prevent construction materials and debris from falling into the river, and secondary containment protection in the Verde River floodplain for containers of hazardous materials and gasoline-powered tools and equipment.
- Any vehicle and equipment refueling, storage, or repair that occurs in the floodplain will be restricted to a staging area or other designated area that includes secondary containment protection that includes a berm or excavated ditch to impound potential leaks or spills.
- All vehicles and heavy equipment that operate in the floodplain will possess spill containment equipment.
- Crews will pour concrete only in dry conditions or within confined waters not being returned to surface waters of the Verde River, and shall cure concrete for at least 24 hours before contact with surface water occurs.
- Work crews will remove litter and trash from the river corridor on a daily basis, and will remove all construction materials, debris, and temporary structures from the floodplain upon completion of the project.

- In the event of a spill or containment breach, work crews will cease all construction activity immediately. The biological monitor will contact FWS and other cooperating agencies to determine appropriate actions, including clean-up measures and measures to prevent additional spills.
- Stormwater plans will prescribe responses to flood events that may occur during construction. If work areas become inundated or saturated with water during a flood, work crews will cease all construction activity and remove vehicles and heavy equipment, the temporary bridge, and materials and supplies stored in secondary containment areas from the floodplain.

### **Conservation Measures**

Conservation measures represent commitments made by the action agencies and project sponsor to minimize effects of the proposed action on listed species and their designated and proposed critical habitats. Conservation measures will help to define and limit work areas, reduce vegetation removal when possible, and minimize effects to listed species. We have organized general conservation measures roughly in chronological order and present species-specific measures, and several measures identified for the USFS to implement, at the end of the section.

#### Appointment of a Biological Monitor

- Before February 2022, when vegetation removal and other pre-construction activities begin, Yavapai County with FHWA oversight shall appoint and hire a full-time field biologist to monitor construction activities throughout the construction footprint, implement conservation commitments, including a relocation protocol for northern Mexican gartersnakes, and report encounters with listed species. The biological monitor will be on site at all times during bridge construction, beginning with vegetation clearing and other pre-construction activities in the Verde River floodplain in February 2022, and ending with completion of post-construction site restoration at the bridge site in January 2023. The biological monitor shall be or shall work under the supervision of a qualified biologist holding a FWS section 10 (a)(1)(A) recovery permit for the northern Mexican gartersnake.

#### Environmental Awareness Training

- Before February 2022, the biological monitor will produce a handout on listed species that occur in the action area and present an environmental awareness program to on-site project personnel, including but not limited to contractors, contractors' employees, supervisors, inspectors, and subcontractors. The program will contain, at a minimum, information concerning the biology and distribution of the southwestern willow flycatcher, yellow-billed cuckoo, Mexican spotted owl, northern Mexican gartersnake, narrow-headed gartersnake, razorback sucker, spikedace, and loach minnow, their occurrence in the action area, measures to avoid impacts, and procedures to follow if encounters with these species occur.

Pre-Construction Conservation Measures

- A Yavapai County biologist or biologist under contract to Yavapai County shall be present during preliminary geotechnical tests at the proposed bridge crossing in July 2020 to monitor encounters with listed species during the tests. The biologist's primary role will be to observe and shall not make hands-on contact with any listed birds or snakes seen during the tests. The biologist shall provide a brief report to FWS providing details of any observations or encounters that occur.
- In spring and summer 2020 and/or 2021, a Yavapai County biologist or biologist under contract to Yavapai County will conduct botanical surveys for USFS sensitive species, targeting limestone soil endemics, including the endangered Arizona cliffrose. This soil type does not occur in the action area but occurs nearby. If surveyors find Arizona cliffrose plants, they will contact FWS and USFS to determine if conservation actions are necessary.
- To assure work crews and heavy equipment remain inside designated limits during bridge construction, the construction contractor will conduct a pre-construction site visit to identify and mark (fence or flag) the perimeter of the construction footprint.
- Before vegetation clearing occurs in the floodplain, the contractor and biological monitor, in cooperation with USFS personnel, will identify and mark all facility and work area locations in the construction footprint, including the temporary bridge, earthen berms, piers, abutments, bridge approaches crane pads, and staging, stockpiling, and containment areas.
- Before vegetation clearing occurs in the floodplain, the contractor and biological monitor, in cooperation with USFS personnel, will identify and mark all stands of woody vegetation requiring removal. The biological monitor will also demarcate riparian vegetation to avoid and retain.
- Trees >12 inches in diameter will be avoided when possible and no trees >24 inches in diameter will be removed unless it is clearly necessary to achieve project objectives. Before removal, the contractor and biological monitor will individually mark trees >12 inches in diameter that will be removed.
- Before vegetation removal occurs, the biological monitor will submit a report to FWS and USFS summarizing the number of trees marked for removal by species, their diameters, relative positions in the canopy, and locations. The report will also provide data on acreages and species compositions of riparian woodlands marked for removal. The report will aid the development of a post-construction revegetation plan as described below.
- Trees removed from the riparian corridor will be cut to ground level, but when possible, root masses will be left intact to help stabilize soils and provide opportunities for regrowth through adventitious shoots (e.g., in the case of willows).
- The biological monitor will be present during all vegetation clearing operations.
- After vegetation clearing and before bridge construction begins, Yavapai County will prepare a biological monitor-drafted and Federal Highway Administration-approved post-construction revegetation and habitat restoration plan for the Verde River floodplain that is consistent with the Biological Opinion. The plan would be submitted to FWS, ACOE, and USFS for review and approval. The FWS must approve the revegetation plan at least 60 days before site restoration efforts begin.

- The revegetation plan will also provide for seeding of disturbed areas along the bridge approaches with appropriate upland seed mixtures, and may include protocols for salvaging and transplanting special-status species, including limestone soil endemics, if found during pre-construction surveys.

#### Conservation Measures Observed during Construction

- During construction, the contractor will permit no work in flowing surface water anywhere on the Verde River floodplain. No vehicles or construction equipment of any kind shall enter the river's wetted channel for any purpose. All vehicle traffic and movement of heavy equipment, materials, and personnel between the east and west sides of the Verde River will cross the active channel on a temporary bridge installed for that purpose.
- The contractor shall not pump water from the Verde River for any reason.
- The contractor shall not designate or construct parking or trailhead areas in the action area that would attract the public to the Verde River corridor.
- To prevent the introduction of invasive plants into the construction footprint, the contractor shall wash all vehicles and earthmoving equipment at the contractor's equipment storage facility prior to entering the construction footprint.
- To prevent invasive species from leaving the construction footprint, the contractor shall inspect all construction vehicles and equipment and remove all attached plants, plant debris, soil, and mud before leaving the construction footprint.
- After construction begins, work crews will not remove large trees or riparian patches that were not initially marked for removal, without FWS concurrence.
- The contractor and all project personnel shall avoid all flagged or otherwise designated sensitive resource areas within or adjacent to the construction footprint.
- Project personnel shall avoid shrubs and trees to the extent possible, even if not demarcated for avoidance.
- The biological monitor will assure that construction activities and equipment remain within the construction footprint during construction and that no unauthorized vegetation removal occurs.

#### Post-Construction Conservation Measures

- After construction, and following procedures outlined in an approved revegetation plan, the contractor will rehabilitate and return all disturbed areas within the construction footprint to as near their original condition as possible, including the floodplain, floodplain embankments, the temporary access road, and upland areas disturbed during construction of the bridge approaches.
- To restore disturbed areas, work crews will re-contour and grade altered ground surfaces, seed disturbed areas with appropriate native seed mixes, and plant pole cuttings of native cottonwoods and willow in the floodplain to hasten recovery of affected riparian woodlands (see additional discussion on the revegetation plan below).
- To discourage public access to the river after construction, in addition to restoring the temporary access road into the floodplain, the construction contractor will restore any temporary parking areas near the bridge used during construction.

Southwestern Willow Flycatcher and Western Yellow-billed Cuckoo Conservation Measures

- A Yavapai County contractor will conduct protocol surveys for the flycatcher and cuckoo in the construction footprint and action area during the 2020 breeding season. Results of these surveys will supplement data from protocol surveys completed in 2019 and used in our effects analysis for flycatchers and cuckoos. If the 2020 survey data submitted by Yavapai County indicate the need to reconsider the FWS effects analysis in this BO for either species, FWS will notify FHWA.
- Vegetation clearing in the construction footprint will occur in February 2022, outside the migration and breeding periods of the flycatcher and cuckoo to prevent injuries or fatalities to adult flycatchers or cuckoos, their eggs, or young that could be expected to occur as a result of vegetation removal operations.
- Bridge construction will begin in early April 2022 before flycatchers and cuckoos arrive at breeding areas along the Verde River. This measure will minimize the likelihood that construction activities will disrupt or displace ongoing breeding attempts from the construction footprint when bridge construction begins. Due to ongoing construction activities, birds may avoid the construction footprint when attempting to establish nesting territories.
- Flycatchers and cuckoos may attempt to establish nests in or near the construction footprint in spite of elevated disturbance levels when they arrive on the Verde River during spring 2022. If this occurs, the contractor will establish and mark avoidance areas around occupied nests.

Northern Mexican Gartersnake Conservation Measures

- A Yavapai County biologist or biologist under contract to Yavapai County will develop a gartersnake monitoring and relocation protocol and FWS will approve the protocol prior to any ground-disturbing activity within the construction footprint. The snake monitoring and relocation protocol will specify procedures for conducting visual encounter surveys for gartersnakes during construction, for capturing and releasing snakes, and for processing and reporting snakes found dead or injured. The protocol will also specify appropriate responses if the biological monitor is unable to capture a detected gartersnake and the snake does not leave the construction site on its own.
- No more than 24 hours before vegetation removal or other ground-disturbing activities begin on the Verde River floodplain, the biological monitor will arrange for and conduct a pre-construction survey for northern Mexican gartersnakes. The objective will be to capture and safely relocate as many gartersnakes as possible from the construction footprint. This survey will be conducted by a minimum of five persons walking the banks or wading close to the shoreline of the Verde River. Surveys will extend into upland habitat, including the planned access road location and bridge approaches. These surveys are intended to produce captures; they will not be strictly time- or area-constrained.
- At the start of each work day, the biological monitor will check under vehicles, equipment, and construction materials for sheltered northern Mexican gartersnakes and relocate any snake found.

- The biological monitor will search for northern Mexican gartersnakes in boulder piles, vegetation, and along the streambank ahead of work crews every day that work occurs within 600 feet of the Verde River's active channel.
- To discourage gartersnakes from sheltering inside the construction footprint during construction, work crews will avoid the creation of debris piles that may attract snakes and will not leave such piles in place (e.g., overnight). During pre-construction activities, crews will remove woodpiles and items of human-made trash that are already present on the floodplain (snakes can hide under human trash).
- The biological monitor will report any northern Mexican gartersnakes detected during the project to FWS within 48 hours of detection.
- To prevent entrapment of gartersnakes, holes and trenches will be backfilled the same day they are excavated or will be covered overnight. Work crews will cover holes with pieces of plywood or suitable material and cover that material entirely with plastic. Crews will secure the edges of the plastic with excavated soil so there are no gaps where wildlife may enter.
- To minimize risks of gartersnake entanglement in erosion control products, use of these products will conform to the following guidelines:
  - *Loose-weave netting.* Use erosion control products with movable (not fixed or welded) joints between the horizontal and vertical twines. Twines that move independently reduce the risk of gartersnake entanglement. Netting designs with movable joints are called loose weave, leno weave, or gauze weave.
  - *Mesh Size.* Avoid using products with a mesh size of 0.5-inch square; this mesh size has the highest likelihood of snake entanglement. Instead, use larger mesh sizes (3 x 3, 3 x 4, or 1.7 x 0.8 inches), or rectangular meshes with a smaller, 0.25-inch aperture in one direction (1.25 x 0.25 inches), which are less prone to snake entanglements.
  - *Natural-Fiber Materials.* Use biodegradable, natural-fiber products (including netting, filling, and thread) as opposed to synthetic plastic products. They are more wildlife-friendly than synthetic plastic products. Natural fibers allow entangled snakes a better opportunity to escape because of their lower tensile strength.
  - *Products without Netting.* Some erosion and sediment control products do not contain netting. These include net-less erosion control blankets (for example, made of excelsior), loose mulch, hydraulic mulch, soil binders, unreinforced silt fences, and straw bales. Net-less erosion control products do not risk entanglement of gartersnakes.
  - *Prompt Removal of Products.* Remove erosion control products promptly after they have served their purpose to lessen the risk of gartersnake entanglement.
- When a northern Mexican gartersnake is found, all work will stop within 50 feet of the animal while the biological monitor relocates it from harm's way.
- The biological monitor will thoroughly document all gartersnake fatalities related to project activities, and will report them to FWS immediately. When the bridge is complete, the contractor will replace escape cover and shelters eliminated by construction activities by stacking debris from tree clearing activities (e.g., sticks, branches, limbs) into piles along the river bank and throughout the floodplain. Because subsequent floods are likely to remove woody debris subsequent floods, the contractor will also create rock piles along the riverbanks to provide shelters for gartersnakes.

### Conservation Measures for U.S. Forest Service

- ROW fencing will be wildlife friendly, with a maximum fence height of 42-inches for the top wire, and a minimum of 12-inches between the top two wires. The bottom wire is to be smooth (un-barbed), and a minimum height of 18-inches from the ground. Work crews will follow fencing guidelines provided by the Arizona Game and Fish Department (AGFD) (*Wildlife Compatible Fencing*) (AGFD 2006).
- To assist in the design, planning, and placement of culverts and to minimize impacts of these structures on wildlife movements, culvert construction will follow AGFD's *Guidelines for Culvert Construction to Accommodate Fish and Wildlife Movement and Passage* (AGFD 2011). Culvert design objectives will include maintenance of the dimension, pattern, and profile of the stream's geomorphology; sizing to allow wildlife passage; use of rip-rap in limited amounts; and use of natural materials in floor construction.

### **Action Area**

The action area is defined as all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action (50 CFR § 402.02). In delineating the action area, we evaluated the farthest-reaching physical, chemical, and biotic effects of the action on the environment.

The action area for this project includes: 1) the proposed Verde Connect roadway, bridge, and MVR Connector areas subject to vegetation removal and other construction-related surface disturbances (the construction footprint); 2) areas immediately surrounding the construction footprint that may be affected by construction noise and disturbance; and 3) the Verde River surrounding the construction area that may be affected by the bridge, construction, sediments, or contaminants. It is difficult to know specifically where these surrounding effects (noise, sediment, etc.) may extend, but expect the farthest reach conservatively at a mile radius around the road project at the Verde River.

## **STATUS OF THE SPECIES AND DESIGNATED AND PROPOSED CRITICAL HABITATS**

### **Southwestern Willow Flycatcher**

The flycatcher was listed as endangered without critical habitat on February 27, 1995 (60 FR 10694). Critical habitat was initially designated on July 22, 1995 (62 FR 39129) and was revised on October 19, 2005 (70 FR 60886) and January 2, 2013 (78 FR 344). A recovery plan for the species was completed in 2002 (USFWS 2002), and a 5-year review was completed in 2014 (USFWS 2014). In 2017, a 12-month review (including an updated 5-year review), responding to a delisting petition, determined that no change was needed to the flycatcher's subspecies classification or its status as endangered (USFWS 2017).

The flycatcher is endangered primarily because land and water management actions associated with agriculture and urban development have reduced, degraded, altered, and eliminated much of

its riparian habitats. Other threats include human recreation along rivers and streams, livestock grazing, predation, brood parasitism by brown-headed cowbirds (*Molothrus ater*), release and spread of the tamarisk-eating leaf beetle (*Diorhabda carinulata*), and wildfires that have become more frequent and destructive as a result of the drying of rivers, degrading of watersheds, increase in ignition sources, and proliferation of exotic vegetation. Nestling predation and cowbird parasitism are the most common forms of direct mortality. Tamarisk (*Tamarix* spp.) often flourishes in areas where native trees are unable to grow due to water regulation and groundwater pumping; thus, loss of tamarisk without replacement by native trees will likely impact flycatchers wherever their range overlaps with the tamarisk leaf beetle. All existing threats are compounded by the risk of stochastic events because flycatcher habitats are fragmented and because populations occur at low numbers.

The southwestern willow flycatcher is one of four currently recognized subspecies of the willow flycatcher, a neotropical migrant and spring/summer resident of North America (Unitt 1987, Browning 1993). This subspecies breeds in the southwestern U.S. and winters in Mexico, Central America, and possibly northern South America (Phillips 1948, Stiles and Skutch 1989, Peterson 1990, Ridgely and Tudor 1994, Howell and Webb 1995).

This flycatcher is a riparian obligate and insectivore. Flycatchers are typically found along rivers, lakesides, and other wetlands with dense riparian habitat consisting of multi-layered tree canopies of varying sizes and age classes. Occupied flycatcher territories are usually located near or over surface water or saturated soils.

In Arizona, nesting flycatchers are found within two general areas: 1) monotypic native riparian or tamarisk habitats, and mixed native riparian and tamarisk habitats, along broad, flat floodplains below about 4,000 feet in elevation; and 2) willow (*Salix* spp.) thickets along streams typically occurring in broad, flat meadows above 7,000 feet. Historical egg/nest collections and species descriptions throughout its range describe the flycatcher's widespread use of willow for nesting (Phillips 1948, Phillips et al. 1964, Hubbard 1987, Unitt 1987); however, in Arizona and other states tamarisk is an important nest tree species for flycatchers.

Tamarisk is a non-native species, yet in 2001, 323 of the 404 known flycatcher nests in Arizona (80%) were in tamarisk (Smith et al. 2002). Tamarisk had been thought to represent poorer flycatcher habitat; however, comparison of reproductive performance, prey populations, and physiological condition of flycatchers breeding in native and exotic vegetation showed no differences (Durst 2004, Owen and Sogge 2002, Sogge et al. 2005, Sogge et al. 2008, USFWS 2002).

Flycatcher habitat is dynamic and can change rapidly (Finch and Stoleson 2000). Tamarisk and native willows, under good growing conditions, can develop from seed to nesting habitat in 3-5 years. Heavy flooding can eliminate habitat or reduce habitat quality in a day. Flycatcher use of habitat in different successional stages may also be dynamic. Over-mature or developing riparian vegetation not suitable for nest placement can be used for foraging and shelter by migrating, breeding, dispersing, or non-territorial flycatchers (McLeod et al. 2005, Cardinal and Paxton 2005).



The riparian patches used by breeding flycatchers vary in size and shape. They may be relatively dense, linear, contiguous stands or irregularly-shaped mosaics of dense vegetation with open areas. Southwestern willow flycatchers nest in patches as small as 0.25 acre along the Rio Grande, and as large as 175 acres in the upper Gila River in New Mexico (USFWS 2002). More recently, Cardinal and Paxton (2005) found that home ranges of telemetered flycatchers at Roosevelt Lake, Arizona, varied from 0.37 to 890 acres (USFWS 2002). Mean patch size of breeding sites supporting 10 or more flycatcher territories was 62.2 acres, although aggregations of occupied patches within a breeding site may create a riparian mosaic as large as 494 acres or more (USFWS 2002). Flycatchers are generally not found nesting in confined floodplains where only a single narrow strip of riparian vegetation less than approximately 33 feet wide develops, although they may nest in such vegetation if it extends out from larger patches, and they may use vegetation of this type during migration (USFWS 2002).

Evidence gathered during multi-year studies of color-banded populations shows that although most southwestern willow flycatchers return to former breeding areas, flycatchers regularly move among sites within and between years (Netter et al. 1998, Kenwood and Paxton 2001, M. Whitfield unpubl. data). From 1997 through 2000, 66% to 78% of flycatchers known to have survived from one breeding season to the next returned to the same breeding site; conversely, 22% to 34% of returning birds moved to different sites (Luff et al. 2000). Both males and females move within and between sites, with males showing slightly greater site fidelity (Netter et al. 1998). Within-drainage movements are more common than between-drainage movements (Kenwood and Paxton 2001). Typical distances moved range from 1.2 to 18 miles; however, long-distance movements of up to 137 miles have been observed on the lower Colorado River and Virgin River (McKernan and Braden 2001). In some cases, willow flycatchers are faced with situations that force movement, such as when catastrophic habitat loss occurs from fire or flood. Several such cases have been documented, with some of the resident willow flycatchers moving to remaining habitat within the breeding site, some moving to other sites 1.2 to 16.8 miles away (Paxton et al. 1996, Owen and Sogge 1997), and others disappearing without being seen again.

#### Southwestern Willow Flycatcher Designated Critical Habitat

We revised designated flycatcher critical habitat on January 2, 2013 (78 FR 344). The revision designated approximately 1,227 stream miles and 208,973 acres of critical habitat for the flycatcher in 24 management units in six states, including Arizona. The physical and biological features for flycatcher critical habitat include items associated with the development of flycatcher habitat and insect prey populations such as water, river flow, flooding, groundwater, seedbeds, and plant germination and growth. We identified the following primary constituent elements (PCEs) for flycatcher critical habitat based on riparian plant species, structure and quality of habitat, and insects for prey:

1. *PCE 1— Riparian Vegetation.* Riparian habitat along a dynamic river or lakeside, in a natural or manmade successional environment (for nesting, foraging, migration, dispersal, and shelter) that is comprised of trees and shrubs (that can include Gooddings willow, coyote willow, Geyer's willow, arroyo willow, red willow, yewleaf willow, pacific willow, boxelder, tamarisk, Russian olive, buttonbush, cottonwood, stinging nettle, alder, velvet ash,

poison hemlock, blackberry, seep willow, oak, rose, sycamore, false indigo, Pacific poison ivy, grape, Virginia creeper, Siberian elm, and walnut) and some combination of:

- (a) Dense riparian vegetation with thickets of trees and shrubs that can range in height from about 6 to 98 feet. Lower-stature thickets (6 to 13 feet tall) are found at higher elevation riparian forests and tall-stature thickets are found at middle and lower-elevation riparian forests;
  - (b) Areas of dense riparian foliage at least from the ground level up to approximately 13 feet above ground or dense foliage only at the shrub or tree level as a low, dense canopy;
  - (c) Sites for nesting that contain a dense (about 50 percent to 100 percent) tree or shrub (or both) canopy (the amount of cover provided by tree and shrub branches measured from the ground);
  - (d) Dense patches of riparian forests that are interspersed with small openings of open water or marsh or areas with shorter and sparser vegetation that creates a variety of habitat that is not uniformly dense. Patch size may be as small as 0.25 acre or as large as 175 acres.
2. *PCE 2—Insect Prey Populations.* A variety of insect prey populations found within or adjacent to riparian floodplains or moist environments, which can include: flying ants, wasps, and bees (*Hymenoptera*); dragonflies (*Odonata*); flies (*Diptera*); true bugs (*Hemiptera*); beetles (*Coleoptera*); butterflies, moths, and caterpillars (*Lepidoptera*); and spittlebugs (*Homoptera*).

### **Western Yellow-billed Cuckoo**

We listed the western yellow-billed cuckoo as threatened on October 3, 2014 (79 FR 59992). Only the Western Distinct Population Segment (DPS), which is larger than its eastern counterpart, was listed. We proposed western yellow-billed cuckoo critical habitat on August 15, 2014 (79 FR 48548), and revised proposed critical habitat on February 27, 2020 (85 FR 11458).

The primary threat to the western yellow-billed cuckoo is loss or fragmentation of riparian nesting habitat. Many factors have altered and eliminated cuckoo habitats, including water diversions, ground water pumping, stream channelization and stabilization, agricultural development, mining, livestock grazing, wildfires, establishment of nonnative vegetation, drought, defoliation of tamarisk by the introduced tamarisk leaf beetle, and prey scarcity due to pesticides (Ehrlich *et al.* 1992, Corman and Wise-Gervais 2005, 79 FR 48548, 79 FR 59992). Habitat fragmentation has led to the isolation of small populations and has increased their susceptibility to further declines and local extirpations due to all the factors discussed above and to stochastic factors such as weather, fluctuating prey populations, and climate change (Thompson 1961, McGill 1975, Wilcove *et al.* 1986).

Cuckoos in the DPS were formerly widespread and locally common in much of the western U.S., Canada, and Mexico (American Ornithologists' Union 1998, Hughes 1999). The largest remaining breeding areas are in southern and central California, Arizona, New Mexico, and northwestern Mexico (79 FR 59992). In Arizona, the species was a common resident chiefly in

the lower Sonoran zones of southern, central, and western Arizona (Phillips et al. 1964). The cuckoo now nests primarily in the central and southern parts of the state.

Western populations of the cuckoo are most commonly found in large tracts of dense, multi-layered gallery forests consisting primarily of cottonwood (*Populus* spp), willow, and mesquite (*Prosopis* spp) (including mesquite bosques) along riparian corridors in otherwise arid areas (Laymon and Halterman 1989, Hughes 1999). The association of breeding within large tracts of riparian habitat is likely related to home range size, although home ranges are flexible and territories may overlap in this weakly territorial species (Hughes 1999, Halterman 2009, Sechrist et al. 2013). Rangewide, individual home ranges during the breeding season average over 100 acres (Laymon and Halterman 1987, Laymon et al. 1997, Laymon and Williams 2002, Halterman 2009, Sechrist et al. 2009, McNeil et al. 2011, 2012, 2013, Sechrist et al. 2013). However, Laymon et al. (1993) reported an average cuckoo home range size of 42 acres, and home range estimates for radio-telemetered cuckoos in New Mexico varied from 12 to 697 acres (Sechrist et al. 2009). In New Mexico, the average maximum daily distance traveled was 2,795 feet, (0.52 mile) and the average maximum seasonal distance traveled was 4,790 feet (0.91 mile).

Extensive riparian forests may support the greatest density of breeding cuckoos, but other habitats are also important for recovery (USFWS 2015). In Arizona, cuckoos may use narrow bands of riparian woodland for nesting (AGFD 2015, Cornell Lab of Ornithology 2015) and even non-riparian habitats (e.g., Madrean evergreen woodlands in the mountain drainages of southeastern Arizona) (Brown 1994, Cornell Lab of Ornithology 2015, Corman and Magill 2000). Tamarisk may be a component of breeding habitat, but there is usually a native riparian tree component present (Gaines and Laymon 1984, Johnson et al. 2008, McNeil et al. 2013, Carstensen et al. 2015). Site-specific variation is likely a result of characteristics unique to each location (e.g., type and quality of habitat, patch configuration) (Hughes 1999, Halterman 2009, Sechrist et al. 2013). Habitat can be found in relatively contiguous stands of dense vegetation, in irregularly shaped mosaics of dense and open vegetation, and in patches that are narrow and linear or savannah-like.

Humid conditions created by surface and subsurface moisture and a multi-layered canopy appear to be important for successful hatching and rearing of young (Hamilton and Hamilton 1965, Gaines and Laymon 1984). Within the boundaries of the DPS, cuckoos occur from sea level to elevations up to 7,000 feet or more; however, the moist conditions that support riparian plant communities typically occur at lower elevations.

Cuckoo breeding habitat in much of the species' range is associated with perennial rivers and streams in regulated and unregulated flows (Poff et al. 1997). In southeastern Arizona, cuckoos are also found nesting along more arid ephemeral and intermittent drainages (Corman and Magill 2000, Corman and Wise-Gervais 2005, AGFD 2015, Cornell Lab of Ornithology 2015). Hydrologic conditions at cuckoo breeding sites can vary widely in a single year and among years, and due to these changes, cuckoos may move from one area to another in the same season and from year to year.

Recent guidance on cuckoo habitat use (USFWS 2015) indicates that cuckoos are more flexible in their choice of foraging and migration stopover habitat than they are in selecting nesting habitat. Foraging areas can be less dense and patchy than nesting areas, with lower levels of

canopy cover (Carstensen et al. 2015, Sechrist et al. 2009, USFWS, unpubl. data). In Arizona, adjacent foraging habitat is usually more arid than nesting habitat. Habitat flexibility during migration may extend to monotypic tamarisk and shrubby habitats, hedgerows, coastal scrub, orchards, and semi-desert grasslands.

#### Western Yellow-Billed Cuckoo Proposed Critical Habitat

On February 27, 2020, we proposed approximately 493,665 acres as cuckoo critical habitat in eight states, including Arizona (85 FR 11458). We proposed the following physical or biological features (PBFs) for cuckoo critical habitat:

*PBF 1—Riparian woodlands; mesquite woodlands (mesquite-thorn-forest), and Madrean evergreen woodland drainages.*

a. Rangewide breeding habitat (including areas in the Southwest) – woodlands within floodplains or in upland areas or terraces often greater than 325 feet in width and 200 acres or more in extent with an overstory and understory vegetation component in contiguous or nearly contiguous patches adjacent to intermittent or perennial watercourses. The slope of the watercourses is generally less than 3 percent but may be greater in some instances. Nesting sites within the habitat have an above average canopy closure (greater than 70 percent), and have a cooler, more humid environment than the surrounding riparian and upland habitats.

b. Southwestern breeding habitat – composed of more arid riparian woodlands (including mesquite bosques), desert scrub and desert grassland drainages with a tree component, and Madrean evergreen woodlands (oak and other tree species), in perennial, intermittent, and ephemeral drainages. These more arid riparian woodland drainages also bisect other habitat types, including Madrean evergreen woodland, native and nonnative desert grassland, and desert scrub. More than one habitat type within and adjacent to the drainage may contribute toward nesting habitat. Southwestern breeding habitat is more water-limited, contains a greater proportion of xero-riparian and non-riparian plant species, and is often narrower, more open, patchier, or sparser than elsewhere in the DPS and may persist only as narrow bands or scattered patches along the bankline or as small in-channel islands. The habitat contains a tree or large-shrub component with a variable overstory canopy and understory component that is sometimes less than 200 acres. Riparian trees (including xero-riparian) in these ecosystems may even be more sparsely distributed and less prevalent than non-riparian trees. Adjacent habitat may include managed (mowed) nonnative vegetation or terraces of mesquite or other drought-tolerant species within the floodplain. In narrow or arid ephemeral drainages, breeding habitat commonly contains a mix of non-riparian vegetation found in the base habitat as well as riparian (including xero-riparian) trees.

*PBF 2—Adequate prey base.*

Presence of prey base consisting of large insect fauna (for example, cicadas, caterpillars, katydids, grasshoppers, large beetles, dragonflies, moth larvae, spiders), lizards, and frogs for adults and young in breeding areas during the nesting season and in post-breeding dispersal areas.

*PBF 3—Hydrologic processes, in natural or altered systems, that provide for maintaining and regenerating breeding habitat.*

This physical or biological feature includes hydrologic processes found in rangewide breeding habitat as well as additional hydrologic processes unique to the Southwest in southwestern breeding habitat:

- a. Rangewide breeding habitat hydrologic processes – Hydrologic processes (either natural or managed) in river and reservoir systems that encourage sediment movement and deposits and promote riparian tree seedling germination and plant growth, maintenance, health, and vigor (e.g., lower-gradient streams and broad floodplains, elevated subsurface groundwater table, and perennial rivers and streams). In some areas where habitat is being restored, such as on terraced slopes above the floodplain, this may include managed irrigated systems that may not naturally flood due to their elevation above the floodplain.
- b. Southwestern breeding habitat hydrologic processes – In southwestern breeding habitat, elevated summer humidity and runoff resulting from seasonal water management practices or weather patterns and precipitation (typically from North American Monsoon or other tropical weather events) provide suitable conditions for prey species production and vegetation regeneration and growth. Elevated humidity is especially important in southeastern Arizona, where cuckoos breed in intermittent and ephemeral drainages.

### **Northern Mexican Gartersnake**

We listed the northern Mexican gartersnake as threatened under the Act on July 8, 2014 (79 FR 38678). We proposed critical habitat on July 10, 2013 (78 FR 41550) and revised the proposed rule on April 28, 2020 (85 FR 23608).

The northern Mexican gartersnake can reach 44 inches in length, and is similar in appearance and may occur with other native gartersnakes. It can be difficult for people without the appropriate expertise to identify this snake.

Throughout its range, this gartersnake occurs at elevations from 130 to 8,497 feet (Rossman et al. 1996). Drummond and Marcías-García (1983) consider this gartersnake a “terrestrial-aquatic generalist.” This gartersnake often occurs in riparian habitat, but also hides in grassland habitat up to one mile from surface water (personal communication from R. Cogan, Conservation Coordinator, Appleton-Whittell Research Ranch, National Audubon Society, April 7, 2015). The subspecies has historically been associated with three general habitat types: 1) source-area wetlands (e.g., cienegas or stock tanks); 2) large-river riparian woodlands and forests; and 3) streamside gallery forests (Hendrickson and Minckley 1984, Rosen and Schwalbe 1988). Emmons and Nowak (2013) found this subspecies most commonly in protected backwaters, braided side channels and beaver ponds, isolated pools near river mainstems, and edges of dense emergent vegetation that offered cover and foraging opportunities. In the northern-most part of its range, the northern Mexican gartersnake appears to be most active from June to September.

The northern Mexican gartersnake is an active predator and is thought to depend heavily on a native prey base (Rosen and Schwalbe 1988). These gartersnakes forage along vegetated

streambanks, searching for prey in water and on land, using different strategies (Alfaro 2002). The diet is mainly amphibians and fishes, such as adult and larval (tadpole) native leopard frogs, as well as juvenile and adult native fish (Rosen and Schwalbe 1988), but earthworms, leeches, lizards, and small mammals are also taken. In situations where native prey species are rare or absent, this snake's diet may include nonnative species, including larval and juvenile American bullfrogs (*Lithobates catesbeiana*), western mosquitofish (*Gambusia affinis*) (Holycross et al. 2006, Emmons and Nowak 2013), or other nonnative fishes.

Natural predators of the northern Mexican gartersnake include birds of prey, other snakes, wading birds, mergansers, kingfishers, raccoons, skunks, and coyotes (Rosen and Schwalbe 1988, Brennan et al. 2009). Historically, large highly predatory native fish species, such as Colorado pikeminnow (*Ptychocheilus lucius*), may have preyed upon northern Mexican gartersnakes where they co-occurred.

Sexual maturity in northern Mexican gartersnakes occurs at two years of age in males and at two to three years of age in females (Rosen and Schwalbe 1988). Northern Mexican gartersnakes are viviparous (bringing forth living young rather than eggs). Mating occurs in April and May, followed by the live birth of between 7 and 38 newborns in July and August (Rosen and Schwalbe 1988, Nowak and Boyarski 2012).

The northern Mexican gartersnake historically occurred in every county and nearly every subbasin within Arizona in habitats that included perennial or intermittent creeks, streams, and rivers and lentic wetlands such as cienegas, ponds, and stock tanks (Rosen and Schwalbe 1988, Rosen et al. 2001; Holycross et al. 2006). In New Mexico, the gartersnake had a limited distribution that consisted of scattered locations throughout the Upper Gila River watershed in Grant and western Hidalgo Counties (Price 1980, Fitzgerald 1986, Degenhardt et al. 1996, Holycross et al. 2006). In Mexico, northern Mexican gartersnakes historically occurred within the Sierra Madre Occidental and on the Mexican Plateau, comprising approximately 85 percent of the total rangewide distribution of the subspecies (Rossman et al. 1996).

The only known viable northern Mexican gartersnake populations in the U.S., where the subspecies remains reliably detected, are in Arizona: 1) the Page Springs and Bubbling Ponds State Fish Hatcheries along Oak Creek; 2) lower Tonto Creek; 3) the upper Santa Cruz River in the San Rafael Valley; 4) the Bill Williams River; and 5) the middle/upper Verde River. In New Mexico and elsewhere in Arizona, the gartersnake may still occur in extremely low population densities. The status of this snake in Mexico and on tribal lands in the U.S. is poorly understood.

We have concluded that in as many as 23 of 33 known localities in the U.S. where this snake occurred (70 percent), its populations are likely not viable and may exist at low enough densities that populations are threatened with extirpation. The northern Mexican gartersnake may already be extirpated in many of these locations. Presence of harmful nonnative species is the most significant reason for the decline of this snake. Harmful nonnative species may include, but are not necessarily limited to, fish in the families Centrarchidae and Ictaluridae, American bullfrogs, and any species of crayfish (e.g., *Orconectes virilis*, *Procambarus clarkia*). Harmful nonnative species can cause starvation of gartersnakes through competition and may reduce or eliminate recruitment of young gartersnakes through predation. Other threats include alteration of rivers and streams from dams, water diversions, flood-control projects, and groundwater pumping that

reduces or eliminates habitat and favors harmful nonnative species. Climate change and drought are also important threats (79 FR 38678).

#### Northern Mexican Gartersnake Proposed Critical Habitat

We proposed critical habitat for the northern Mexican gartersnake in seven Arizona counties and one county in New Mexico totaling 27,784 acres (85 FR 23608). Within these areas, the physical and biological features (PBFs) essential to gartersnake conservation are:

1. Perennial or spatially intermittent streams that provide both aquatic and terrestrial habitat that allows for immigration, emigration, and maintenance of population connectivity of northern Mexican gartersnakes and contain:
  - (A) Slow-moving water (walking speed) with in-stream pools, off-channel pools, and backwater habitat;
  - (B) Organic and natural inorganic structural features (e.g., boulders, dense aquatic and wetland vegetation, leaf litter, logs, and debris jams) within the stream channel for thermoregulation, shelter, foraging opportunities, and protection from predators;
  - (C) Terrestrial habitat adjacent to the stream channel that includes riparian vegetation, small mammal burrows, boulder fields, rock crevices, and downed woody debris for thermoregulation, shelter, foraging opportunities, brumation, and protection from predators; and
  - (D) Water quality that is absent of pollutants or, if pollutants are present, at levels low enough such that recruitment of northern Mexican gartersnakes is not inhibited.
2. Hydrologic processes that maintain aquatic and terrestrial habitat through:
  - (A) A natural flow regime that allows for periodic flooding, or if flows are modified or regulated, a flow regime that allows for the movement of water, sediment, nutrients, and debris through the stream network; and
  - (B) Physical hydrologic and geomorphic connection between a stream channel and its adjacent riparian areas.
3. Prey base of primarily native anurans, fishes, small mammals, lizards, and invertebrate species.
4. An absence of nonnative fish species of the families Centrarchidae and Ictaluridae, bullfrogs (*Lithobates catesbeianus*), and/or crayfish (*Orconectes virilis*, *Procambarus clarki*, etc.), or occurrence of these nonnative species at low enough levels such that recruitment of northern Mexican gartersnakes is not inhibited and maintenance of viable prey populations is still occurring.
5. Elevations from 130 to 8,500 feet (40 to 2,590 meters).
6. Lentic wetlands including off-channel springs, cienegas, and natural and constructed ponds (small earthen impoundment) with:
  - (A) Organic and natural inorganic structural features (e.g., boulders, dense aquatic and wetland vegetation, leaf litter, logs, and debris jams) within the ordinary high water mark for thermoregulation, shelter, foraging opportunities, brumation, and protection from predators;
  - (B) Riparian habitat adjacent to ordinary high water mark that includes riparian vegetation, small mammal burrows, boulder fields, rock crevices, and downed woody debris for thermoregulation, shelter, foraging opportunities, and protection from predators; and

- (C) Water quality that is absent of pollutants or, if pollutants are present, at levels low enough such that recruitment of northern Mexican gartersnakes is not inhibited.
7. Ephemeral channels that connect perennial or spatially interrupted perennial streams to lentic wetlands in southern Arizona where water resources are limited.

## **ENVIRONMENTAL BASELINE**

Regulations implementing the Act (50 CFR 402.02) define the environmental baseline as the condition of the listed species or its designated critical habitat in the action area, without the consequences to the listed species or designated critical habitat caused by the proposed action. The environmental baseline includes the past and present effects of all Federal, State, or private actions and other human activities in the action area, the anticipated effects of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the effect of State or private actions which are contemporaneous with the consultation in process. The consequences to listed species or designated critical habitat from ongoing agency activities or existing agency facilities that are not within the agency's discretion to modify are part of the environmental baseline.

### **Description of the Action Area**

#### **The River and Floodplain**

The Verde River is the largest perennial tributary of the Salt River in central Arizona. It flows south from its origin above Sullivan Lake Dam, near the Town of Paulden, to the Salt River east of Phoenix. Sullivan Lake has mostly filled in with sediment (Wirt 2005); thus, the river is free flowing until it reaches Horseshoe Reservoir, over 135 mi from its origin (ADWR 2017). The river includes three distinct regions: the upper, middle, and lower Verde watersheds. The middle Verde is a broad alluvial reach that flows through the Verde Valley and includes the river's three main population centers: Clarkdale, Cottonwood, and Camp Verde (from north to south) (Springer and Haney 2008). The proposed Verde Connect/Verde River bridge crossing is at the southern end of Verde Valley, between Cottonwood and Camp Verde.

Within the bridge construction area, the Verde River flows through a shallow canyon. The near-vertical west canyon wall is part of a rocky bluff about 100 feet high that overlooks the canyon. The canyon's east margin rises more gradually. Features of the canyon floor include the river, exposed sand and gravel riverbed, and corridors of riparian woodlands and shrublands along both riverbanks and the outer edges of the floodplain. Tangles and piles of woody debris carried by floods are scattered throughout the area. At the proposed bridge crossing, the river's active channel is about 50 feet wide and 125 feet from the floodplain's east bank; however, the channel braids into several smaller channels immediately upstream and downstream of the bridge crossing. The floodplain ranges in width from approximately 600 feet at the bridge crossing to 1,200 feet about 0.4 mile south of the bridge centerline.



## Vegetation

Within the action area, riverside riparian plants and mesquite woodlands occur along the Verde River and much of the 4.6-acre bridge construction footprint, while upland juniper grassland occur on Forest Service uplands. Plant communities within the 4.6-acre bridge construction footprint include approximately 2.7 acres of Broadleaf Deciduous Riparian Woodlands (Minckley and Brown 1994) on the floodplain and approximately 1.9 acres of Semidesert Grasslands (Turner and Brown 1994) in the floodplain margins and bridge approaches. The Verde River floodplain upstream and downstream and through the proposed bridge area supports mixed woodlands of Goodding's willow (*Salix gooddingii*), coyote willow (*Salix exigua*), seepwillow (*Baccharis salicifolia*), Fremont cottonwood (*Populus fremontii*), box elder (*Acer negundo*), velvet ash (*Fraxinus velutina*), Arizona sycamore (*Platanus wrightii*), and tamarisk (*Tamarix* spp.). Woody vegetation in the semidesert grasslands that dominate the CNF and PNF in the action area—and occur along the proposed roadways—include velvet mesquite (*Prosopis velutina*), creosote bush (*Larrea tridentata*), juniper (*Juniperus* spp.), crucifixion thorn (*Canotia holacantha*), snakeweed (*Gutierrezia sarothrae*), and catclaw (*Senegalia gregii*).

Woodlands immediately downstream of the construction footprint consist of broad, late-successional, mixed cottonwood/willow/sycamore galleries 100-300 feet wide on both sides of the river's main channel (Figure 3). Canopies are uniformly dense, often exceeding 80% closure, but understories lack tall shrubs and trees in smaller size classes. Understories in these galleries are composed of low shrubs, grasses, and forbs. In addition, the understories of these galleries contain tangles and jams of flood debris, including logs, limbs, and branches, smaller diameter woody debris, decomposed vegetation, and trash (personal communication from B. Palmer, Jacobs Engineering Group, Phoenix, April 21, 2020).

In contrast, vegetation immediately upstream of the construction footprint is a mixture of open, patchy, mid- to late-successional riparian woodlands composed primarily of cottonwoods and willow in overstory layers and tamarisk and other riparian trees forming dense understories. Open areas not composed of exposed riverbed (sand and cobble) support a variety of broadleaf deciduous tree species with interspersed tamarisk. Canopy closure in this area of the floodplain averages about 60 percent. The river splits into two channels just north of the construction footprint, one hugging the east bank of the floodplain, the other hugging the west bank. Braiding of the river has created pools, backwaters, and emergent marshlands.

Vegetation in the construction footprint consists of linear strands of cottonwood and willow along both sides of the Verde River's main channel and a strand of cottonwoods along the floodplain's western border, intermixed with open shrubby areas and areas of exposed sand and gravel (Figures 3-4). Like the downstream galleries, woodlands in the construction footprint lack understory development.

The 100-year floodplain includes terraces on both sides of the river dominated by dense stands of mesquite. Mesquite woodlands on the east margin of the floodplain form a band 80-125 feet wide. The OK Ditch, a historic irrigation canal that is still in use, bisects this forest. The floodplain terrace on the west side of the river is narrower and constrained by the west canyon wall, but also supports mesquite.

### Development and Land Use

Although the immediate area surrounding the proposed bridge and road include a variety of land uses, the action area is largely undeveloped. ASLD, CNF and PNF land. There are no developed recreational access points to the river at the proposed crossing, and although the public can access the area by floating the river from upstream, PNF encourages organized river groups to exit the river upstream of the bridge area. The bridge and roadway area can also be accessed via various unpaved CNF and PNF roads; however, other than a 2-track off-road vehicle trail west of the river (Figure 4), there is no motorized access into the floodplain.

Primary land uses outside the immediate roadway include ASLD, CNF and PNF land, and various agriculture, ranching, residential development, mining, and recreation. Private land uses include a sand and gravel operation approximately 0.5 mile west and downstream of the bridge construction site, and ranching and agricultural development about 0.4 mile to the east. ASLD lands west of the river are used for grazing, and PNF manages its lands at the western bridge approach for motorized and non-motorized recreation. CNF lands east of the river are managed for motorized and non-motorized recreation, grazing, and livestock use. CNF's White Hills Trail System is 2.7 miles east of the Verde River between Cornville Road and the junction of FSR 119A and 119B. Trails there are primarily for motorbike use, but other recreational uses, such as horseback riding and hiking also occur.

### **Status of the Species and Critical Habitats in the Action Area**

#### Southwestern Willow Flycatcher

From May 22 to July 17, 2019, a Yavapai County contractor, Jacobs Engineering Group, conducted formal protocol surveys (Sogge et al. 2010) for flycatchers within the construction footprint and action area. The contractor surveyed all flycatcher habitat on both sides of the river, from the bridge centerline upstream (north) for 0.5 mile, and downstream (south) for 0.35 mile. Surveys occurred on 11 days (a total of 49.2 survey hours) at 98 broadcast call points along 7 transects, ranging in length from about 200 to 2,400 feet (Jacobs 2019a). An additional transect was surveyed 1.25 miles upstream of the Oak Creek/Verde River confluence, >3 miles north of the construction footprint.

Protocol surveys in 2019 confirmed southwestern willow flycatcher territories near the Verde Connect/Verde River crossing and that nesting likely occurs in the action area. Jacobs Engineering biologists recorded 11 flycatcher detections during protocol surveys and an additional 5 incidental detections (e.g., recorded during cuckoo surveys or other activities). Two of the 11 protocol detections occurred upstream of Oak Creek (outside the action area). Nine protocol and 3 incidental detections occurred within the action area, from 0.25 to 0.45 mile north of the construction footprint, on both sides of the river. A cluster of 7 detections along a 0.1-mile stretch of the river occurred about 0.3 mile north of the construction footprint and included detections during four different surveys from June 6 to July 17, and observations of two flycatchers interacting vocally in mid-June. According to the survey protocol, this indicates that a breeding pair was present in that area. Other detections were somewhat more dispersed and could represent a second pair, or territories occupied by lone birds (Jacobs 2019a).

*Southwestern Willow Flycatcher Designated Critical Habitat*

The action area is within the 9.5-mi-long Upper Verde River Management Critical Habit Unit which extends from near the Town of Cottonwood downstream past the Verde Connect crossing, past the Verde River bridges at Interstate 17, and past the Town of Camp Verde (78 FR 344). The PCEs and the physical and biological features of designated flycatcher critical habitat (riparian vegetation, and insect prey populations) occur within the action area.

Southwestern willow flycatchers typically occur in riparian corridors with dense willows, tamarisk, and mixed riparian vegetation interspersed with open water, marsh, or saturated soils, and shorter/sparser vegetation that creates a mosaic of cover types (78 FR 344). This is a good description of riparian areas in the action area and specifically north of the construction footprint where 12 flycatcher detections occurred during protocol surveys in 2019. Areas north of the footprint exhibit a high degree of patchiness, with areas of dense shrubs and small trees under multi-layered overstories, narrow stringers of trees, patches of open ground, and some braiding of the river creating pools, backwaters, and emergent marshlands.

The absence of flycatcher detections downstream of the construction footprint does not mean that foraging, migrating, or dispersing flycatchers were not present in 2019 or that they have not nested in these areas in previous years. Surveyors could not search farther downstream than 0.35 mile because of a private property line. Riparian areas south of the proposed bridge crossing support broad bands of mature gallery forest with uniform, dense canopies (80% or more closure) and less patchiness overall than areas to the north, but they lack the well-developed understories that seem to attract nesting flycatchers. Vegetation in the construction footprint is relatively thin and lacks both the overstory development that characterizes downstream areas and the well-developed understories of upstream habitats. These qualities of reduced riparian habitat understory in the construction footprint are locations where flycatchers typically do not place nests. At this time, vegetation in the construction footprint appears to be primarily suitable for flycatcher foraging, dispersing, and migration.

We have no data on insect prey populations, but based upon the occurrence of flycatcher territories, mosaics of open and closed cover types in and adjacent to the construction footprint, and perennial flows with braiding and backwaters, we expect that insect prey are available throughout the construction footprint and action area.

Western Yellow-billed Cuckoo

From June 15 to August 7, 2019, Jacobs Engineering conducted cuckoo protocol surveys (Haltermann et al. 2016) within the construction footprint and action area. The contractor surveyed all cuckoo habitat on both sides of the river, from the bridge centerline upstream (north) for 0.5 mile, and downstream (south) for 0.35 mile. Surveys occurred on 5 days (25.2 total survey hours) at 15 broadcast call points along one 0.9-mile-long transect (Jacobs 2019b).

Jacobs Engineering biologists recorded 13 cuckoo detections during protocol surveys, representing up to seven individuals, and an additional 4 incidental detections that occurred during flycatcher surveys or other activities. All 13 protocol and 2 incidental cuckoo detections occurred within about 0.70 mile of the construction footprint. Detections occurred north and

south of the bridge centerline and on both sides of the river. Surveyors detected one cuckoo inside the construction footprint and five were within 200 feet of the footprint. Based on guidance provided in the cuckoo survey protocol, Jacobs biologists concluded that one possible and two probable breeding pairs were present in the action area during the 2019 surveys. Biologists reported a possible breeding pair about 0.2 mile south of the construction footprint (based on two detections in that area during two survey periods). A probable breeding pair occurred 0.1 mile north of the footprint, based on three detections during three surveys, and another probable breeding pair occurred 0.47 mile north of the footprint, also based on three detections during three surveys.

#### *Western Yellow-Billed Cuckoo Proposed Critical Habitat*

The action area is within the 6,047-acre Upper Verde River Proposed Cuckoo Critical Habitat Unit, in Yavapai County, which extends from the confluence of the Verde River with Oak Creek southeast to I-17 (85 FR 11458). As detailed above, cuckoo proposed critical habitat PBFs include 1) riparian woodlands; mesquite woodlands (mesquite-thorn-forest), and Madrean evergreen woodland drainages; 2) adequate prey base; and 3) hydrologic processes, in natural or altered systems that provide for maintaining and regenerating breeding habitat.

Three relatively distinct zones characterize riparian vegetation in the action area. Woodlands downstream of the construction footprint resemble PBF 1a (rangewide breeding habitat) and woodlands to the north are typical of PBF 1b (southwestern breeding habitat). Vegetation in the construction footprint is more open than areas to the north and south.

Southwestern breeding habitats often bisect other habitat types, including native and nonnative desert grassland and desert scrub, which describes habitats within the construction footprint above the floodplain (i.e., on the floodplain terraces where dense stands of mesquite occur), and above the terraces where scattered juniper and crucifixion thorn intermix with native and nonnative grasslands.

To summarize, all vegetation within the action area and construction footprint represents suitable cuckoo nesting, dispersal, foraging, and migration habitat, and protocol survey data support that conclusion. Biologists detected cuckoos north and south of the proposed bridge crossing, on both sides of the river, and in all three of the riparian zones. One detection occurred inside the construction footprint and five were within 200 feet of the footprint. One possible and two probable breeding pairs were reported, two north of the bridge crossing and one south of the crossing.

We have no data on prey populations, but based upon cuckoo presence, mosaic of open and closed cover types in and adjacent to the construction footprint, perennial flows with braiding and backwaters, we expect that large insect prey, lizards, and frogs are available to cuckoos throughout the construction footprint and action area at this time.

The upper Verde River through the action area is perennial, dynamic, and deposits sediment for seedling germination and growth. The river is low gradient, the floodplain is broad with an elevated subsurface groundwater table, and riparian woodlands occur throughout the action area.

### Northern Mexican Gartersnake

FHWA and Yavapai County did not conduct gartersnake surveys for this project, but gartersnake research and monitoring efforts have occurred within the Verde River Basin. From 2012 to 2015, AGFD conducted research at seven sites on and adjacent to the Verde River (Emmons and Nowak 2016). Study sites extended from Pecks Lake, north of Cottonwood, downstream past the Verde Connect action area to the Camp Verde Riparian Preserve (CVRP) near the I-17 Bridge. Biologists trapped or observed 168 gartersnakes; 105 (62 percent) were in the CVRP. The remaining 63 detections occurred at four of the six study sites upstream of the CVRP.

AGFD's Heritage Data Management System (HDMS) described the occurrence of northern Mexican gartersnake within 2 miles of the construction footprint (Jacobs Engineering 2019), and AGFD's HabiMap program indicates the construction footprint is within the species' range.

### *Northern Mexican Gartersnake Proposed Critical Habitat*

The action area is within the 4,133-acre Verde River Proposed Northern Mexican Gartersnake Critical Habitat Subunit. The subunit includes the Verde River from near Perkinsville downstream to Camp Verde. All 4.6 acres of the construction footprint occur within proposed gartersnake critical habitat. Relevant proposed gartersnake PBFs include 1) perennial or spatially intermittent streams that provide both aquatic and terrestrial habitat; 2) hydrologic processes that maintain aquatic and terrestrial habitat; 3) native prey base; and 4) absence of nonnative aquatic species.

The construction footprint and action area support high quality aquatic, riparian, and terrestrial habitats (PBFs 1-2). The Verde River is free flowing, perennial, has a low gradient, floods periodically, and has instream boulders, pools, and backwaters. The riverbanks and riparian vegetation along the banks have the organic and inorganic structural complexity (boulders, woody debris, leaf litter, and plant cover) necessary for gartersnake sheltering, foraging, and other life functions. The floodplain is wide and structurally complex and bounded to the west by rocky slopes, which are important habitat components for sheltering and brumating gartersnakes.

Emmons and Nowak (2016) documented three native fish species in the Verde River Basin: desert sucker (n=34), Sonora sucker (n=3), and speckled dace (n=1) and an abundance of nonnative fish and aquatic species. The authors reported over 11,000 mosquito fish, over 5,000 green sunfish, nearly 800 largemouth bass, and hundreds of individuals from seven other nonnative fish species. They also documented nearly 4,000 bullfrogs (tadpoles to adults) and over 800 crayfish. While they detected a mixture native and exotic prey species and aquatic predators, the authors also reported 105 captures and detections of northern Mexican gartersnakes at the Camp Verde Riparian Preserve 6 miles downstream of the Verde Connect.

### **Factors Affecting the Species and Critical Habitat in the Action Area**

The Verde River within the action area maintains flow characteristics (perennial flows with periodic flooding) necessary to maintain aquatic and riparian habitat for flycatchers, cuckoos, and the northern Mexican gartersnake. However, the river's ability to maintain conditions for listed species over the long-term is not assured. Drought or drought-like conditions, possibly

related to climate change, have occurred throughout much of Arizona since at least 2009 (ADWR 2016). In addition, the upper Verde River habitat quality has declined due to groundwater pumping and streamflow diversions for agricultural, municipal, and industrial developments (Wirt 2006). Human population within the Verde River watershed has more than doubled in the last 20 years, and current trends indicate that populations will double again in the next 20 years (72 FR 10810). Thus, reduced base flows and loss of perennial conditions, because of increasing water demand and climate change in the Verde River basin, may represent significant threats to listed species in the action area over the long-term.

### **Previous Section 7 Consultations**

We do not have records for recent or past section 7 consultations specific to the action area, however nearby projects have undergone evaluation at the I-17 Bridge (I-17 Verde River Bridge Scour Retrofit 02EAAZ00-2016-F-0244; Emergency Flood Repair I-17 Verde River Bridge 22410-1995-I-0325; and Environmental Protection Agency National Pollution Discharge Elimination System Permit For Homestead Project At Camp Verde 22410-2001-F-0148). Salt River Project Habitat Conservation Plans for Horseshoe/Bartlett Dams and Roosevelt Dam included mitigation measures on the upper Verde River for flycatchers and native and listed fish. We consulted with the ACOE for the Mingus Ave Extension (2-21-00-F-069), which developed a two-lane bridge over the Verde River near Cottonwood.

### **EFFECTS OF THE ACTION**

In accordance with 50 CFR 402.02, effects of the action are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of all other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action (see §402.17).

### **Southwestern Willow Flycatcher and Western Yellow-Billed Cuckoo**

#### Effects Overview

We anticipate that construction activities, associated noise, and human activity occurring throughout the breeding period for both the flycatcher and cuckoo will harass, and possibly displace nesting birds for one breeding season. Dispersing and migrating flycatchers and cuckoos exposed to elevated noise and disturbance levels during construction will likely take advantage of nearby habitat without further consequence.

Vegetation clearing and other surface alterations will temporarily and permanently affect flycatcher and cuckoo foraging, dispersal, migration, and nesting habitat (and designated and proposed critical habitat) within approximately 4.6 acres of the Verde River floodplain, floodplain margins, and bridge approaches. Much of the construction footprint is currently a mosaic of larger overstory trees and some open spaces. Some vegetation will be able to recover following construction through time and rehabilitation efforts. The bridge's footprint (i.e.

shadow) across the floodplain is expected to result in long-term suppression or fragmentation of plant cover over approximately 1.2 acres.

### Flycatcher and Cuckoo Habitat Removal

Riparian vegetation removal and other floodplain alterations will occur in February and March 2022, before territorial flycatchers and cuckoos arrive in the Verde Connect Project area from their wintering grounds. This will minimize the likelihood that flycatchers and cuckoos will try to nest within the footprint during construction. However, it will also reduce habitat used for nesting, foraging, or dispersing flycatchers and cuckoos.

All vegetation removal that can adversely affect flycatchers and cuckoos will occur in the riparian and mesquite woodlands of the Verde River floodplain. After accounting for exposed sand and gravel used for staging and stockpiling, we estimate the contractor will remove approximately 1.3 acres of vegetation from the 2.7-acre floodplain footprint, leaving the space necessary for bridge construction.

The effects of vegetation removal are likely to be somewhat different for the flycatcher and cuckoo. Because of the lack of understory development, riparian vegetation in the construction footprint is not likely suitable for flycatcher nest placement. A single flycatcher territory was detected about 0.3 mile upstream of the footprint, where the understory is more developed. After construction, preserved vegetation in the footprint will consist primarily of scattered large-diameter trees. Vegetation currently suitable for flycatcher foraging and possibly sheltering within the construction footprint will likely offer fewer habitat features attractive to flycatchers following construction.

Vegetation in the construction footprint currently is suitable for all cuckoo life history functions. Surveyors found breeding cuckoos within the construction footprint with suspected nest areas immediately upstream and downstream of the proposed bridge location. Cuckoos often nest in dense riparian woodlands of cottonwood, willow, mesquite (including mesquite woodlands), and other riparian species that occur in relatively large contiguous patches (79 FR 48548) similar to the construction footprint and immediately adjacent. However, recent guidance on cuckoo habitat use (USFWS 2015) indicates that cuckoos are more flexible in selecting breeding sites than was once understood, and suggests that habitat flexibility during migration and foraging may extend to monotypic tamarisk and even shrubby habitats, hedgerows, and semi-desert grasslands.

Cuckoos also are expected to rely on larger tracts of habitat than flycatchers, where smaller changes may be less impactful. We do not anticipate that the habitat removal for bridge construction will be large enough to cause long-term harm to cuckoos from habitat loss. Nesting areas were believed to occur upstream and downstream of the footprint.

Because nesting flycatchers were found about 0.30 miles upstream, they may disperse and forage within the footprint, but it is not likely, based upon the reduced amount of understory that they will rely on the footprint for nest placement. Flycatcher territories are typically much smaller than cuckoo territories, relying on about 11 acres of overall habitat to support a territory (USFWS 2003). As a result, we do not anticipate, based upon the current known results of

flycatcher distribution and abundance and habitat quality, the vegetation removal will harm nesting flycatchers.

In the long-term, bridge construction is expected to fragment and suppress plant cover in the bridge's footprint (i.e., its shadow) for both flycatchers and cuckoos. Recovery of vegetation surrounding the bridge following construction may take 5-10 years, depending on planting, flooding, and other unknown factors. Ultimately, about 1.2 acres stretching across the floodplain and up the floodplain margins will be permanently lost or changed. The habitat under the bridge deck will not likely fully recover due to reduced light penetration at ground level, especially on the slopes above the floodplain where the deck gets increasingly closer to ground level. However, because of the bridge's height over the floodplain ( $\geq 80$  feet), some vegetation will return. However, the likelihood of vegetation under the bridge recovering and improving to a point where cuckoo or flycatcher nesting habitat is established or relied upon by either bird, does not seem likely.

Recent Verde River flood events in March 2020, likely have altered the specific vegetation acreage calculations identified in the BA and this BO. Until the construction work actually begins, habitat abundance, quality, and distribution may continue to change. However, the space needed to construct the bridge and the permanent fragmentation and alteration from the actual bridge footprint is not expected to change.

### Disturbance Effects

When flycatchers and cuckoos arrive in the action area in spring 2022, bridge construction will be underway and noise and disturbance levels inside the construction footprint will be high. Construction noise will remain high for the duration of the flycatcher (April 15-September 30) and cuckoo (May 15-September 30) migration and breeding period. From April to September 2022, work crews will build the 80-foot-tall bridge substructure—pier shafts, columns, and caps—and beginning in September work on the superstructure will begin (i.e. assembling and placing pre-cast spans, constructing abutments, and pouring the deck).

Based upon the effects of habitat removal prior to nesting flycatchers and cuckoos arriving and the amount of disturbance when nesting birds arrive, we anticipate that all nesting flycatchers and cuckoos attempting to nest within or in close proximity to the construction area will be adversely affected due to harassment, resulting in reduced productivity.

Flycatchers and cuckoos probably will not attempt to breed in or adjacent to the construction footprint in spring 2022, and those that do nest (more likely cuckoos), may abandon or fail due to continued disturbance.

Because of these birds' high site fidelity, we can anticipate during project construction a similar abundance and proximity of breeding flycatchers and cuckoos to that which occurred in 2019. Those flycatchers (1 pair) and cuckoos (2 pairs) that attempted to nest within about 0.25 mile of the construction site in 2019, may very well occur again in 2022, and be harassed from construction noise and not breed, fail during incubation, produce less young, or leave young/eggs unattended and exposed to predation/parasitism. Nearby nesting birds may try to forage within the action area and be disturbed, leaving the area without acquiring food. Given that all



construction activities, including site rehabilitation, will end by January 2023, all disturbance effects related to this project will be limited to the 2022 breeding and migration period.

### Effects to Southwestern Willow Flycatcher Designated Critical Habitat

#### *PCE 1—Riparian Vegetation*

Vegetation removal within the 4.6-acre footprint will adversely affect flycatcher critical habitat, reducing habitat quality for the required space to build the bridge in the short term and fragmenting habitat in the long-term. Habitat removal will create the open space needed to construct the bridge, and park-like stands of trees will remain after construction. Following rehabilitation and time, some vegetation will return. However, flycatcher habitat across the bridge span will be permanently fragmented, even though some vegetation may become re-established underneath the bridge. Bridge construction can alter channel dynamics in the immediate area, possibly affecting vegetation development in the immediate area.

#### *PCE 2—Insect Prey Populations*

Impacts to insect prey populations within affected habitat will likely be reduced temporarily due to the loss of most riparian vegetation within the construction footprint. As vegetation recovers, insect prey populations will also recover. We anticipate short-term but no long-term adverse effects to insect populations.

### Effects to Western Yellow-billed Cuckoo Proposed Critical Habitat

#### *PBF 1 (Riparian Woodlands, Mesquite Woodlands)*

Vegetation removal within the 4.6-acre footprint will adversely affect proposed cuckoo critical habitat, reducing habitat quality for the required space to build the bridge in the short term and fragmenting habitat in the long-term. Habitat removal will create the open space needed to construct the bridge, and park-like stands of trees will remain after construction. Following rehabilitation and time, some vegetation will return. However, cuckoo habitat across the bridge span will be permanently fragmented, even though some vegetation may become re-established underneath the bridge.

#### *PBF 2 (Adequate Prey Base)*

Impacts to prey populations within affected habitat will likely be reduced temporarily due to the loss of most riparian vegetation within the construction footprint. As vegetation recovers, insect prey populations will also recover. We anticipate short-term but no long-term adverse effects to insect populations.

#### *PBF 3 (Hydrologic Processes)*

This PBF emphasizes river systems that are perennial, dynamic, and encourage sediment movement and deposits for seedling germination and growth. No proposed action will affect perennial flows in the Verde River or its ability to transport sediments or provide long-term

regeneration of cuckoo habitat. The bridge will not affect the perennial or dynamic nature of the Verde River. However, bridge construction can alter channel dynamics in the immediate area, possibly affecting vegetation development.

## **Northern Mexican Gartersnake and Proposed Critical Habitat**

### Effects Overview

Northern Mexican gartersnake habitat occurs in the action area and recent research has documented northern Mexican gartersnakes at various locations in the Verde Valley upstream and downstream of the action area in relatively close proximity. Thus, based upon habitat quality and records nearby, there is a reasonable likelihood that northern Mexican gartersnakes occur in the action area.

We anticipate the bridge construction project will adversely affect gartersnakes that shelter or are active in the construction footprint during construction. Adverse effects can include harassment, predation, injuries, and fatalities of individual gartersnakes caused by construction activities.

Adverse effects to gartersnake habitat and proposed critical habitat are anticipated from construction activities. Prior to construction and during grading, vegetation clearing, access road construction, and other site preparations for pier, abutment, approaches, and superstructure construction, temporary and permanent alteration of the Verde River floodplain and adjacent uplands will occur. The action agency will minimize adverse soil, contaminant and sediment effects by implementing BMPs and conservation measures outlined above. Conservation measures are expected to prevent Verde River contamination and excessive sedimentation from construction equipment or accidental spills.

### Construction Effects

Bridge construction will occur from February 2022 to January 2023, overlapping the gartersnake's active period, winter dormancy, and reproductive period (Emmons and Nowak 2016). Gartersnakes spend a disproportionate amount of time in shelters at all times of the year, and although they are typically in subsurface retreats during winter, they may be active on warm days and often move among alternate retreats when brumating (Sprague 2017, Emmons and Nowak 2016, J. Servoss, USFWS, personal communication). Thus, we expect gartersnakes can be either sheltered below ground or surface active during any month that construction occurs.

We expect adverse effects to gartersnakes from the preliminary geotechnical investigation will be insignificant. The preliminary geotechnical investigation is scheduled to occur in summer 2020, requiring one drill rig and a small amount of vegetation removal (approximately 0.02 acre/test site). Crews will immediately plug and cap the three auger holes created by the investigations. Due to the short duration, focused small area where ground disturbance will occur, and capping of auger holes, there is little likelihood that snakes will be affected by the drilling or trapped in auger holes.

Vegetation clearing, grading, and contouring of the floodplain will occur in February and March 2022 when gartersnakes are emerging from winter dormancy. Heavy equipment operations

during this period will be particularly high and risks to gartersnakes will increase accordingly. Work crews will cut trees, grade and contour staging, stockpiling, and containment areas, construct crane pads, and excavate berms for flood control. Creation of berms, and their removal after construction, will require movement of rocks, cobble, and soil in mass amounts. Any snakes sheltered in the excavated material will be at risk of crushing or entrapment. During this period, crews will also remove piles of woody debris to discourage snakes from sheltering inside the construction footprint after bridge construction begins. However, snakes may be sheltered in the piles when they are removed, and may be crushed or trapped in their shelters. Snakes that escape may be crushed by heavy equipment. Given low ambient temperatures at this time of year, individuals that attempt to flee may be sluggish and more vulnerable to injuries and fatalities, whether they result from construction activities, predation, or exposure. On the other hand, gartersnakes are more likely to use off channel or upland areas for sheltering during the winter, which may reduce the number of snakes sheltered in the floodplain during pre-construction activities.

After pre-construction goals are met and bridge construction (piers, abutments, wing walls, and superstructure) begins, vehicle and heavy equipment activity will vary in intensity, but will be a regular and near daily occurrence from April to December. Throughout that time, heavy equipment noise levels and vibrations will represent a dramatic increase above baseline disturbance levels and can affect snake behavior by triggering flight responses or by increasing the time snakes spend under cover. If snakes are underground when these activities occur, individuals may be unearthed, crushed or trapped in their shelters. Snakes that are surface active at the time will be at risk of being injured or killed from vehicle strikes or trampling by ground crews. The biological monitor may capture and relocate snakes that attempt to leave disturbed areas; however, snakes not caught will remain at risk.

Work crews moving stockpiled materials, traveling in vehicles, or departing in vehicles that have been parked can adversely affect gartersnakes because gartersnakes may occur along roads or seek shelter in piles or under parked vehicles. In August and September, more gartersnakes will be at risk of injury or death because neonates (young-of-the-year) will be active along with adult and subadult snakes. In October and November, gartersnake movements away from the river and through the construction footprint and adjacent upland areas may increase as snakes disperse towards off-channel brumation sites. Gartersnakes will be less likely to brumate in or near active construction areas than in areas that are relatively disturbance free; however, snakes on the move will be at risk of vehicle strikes and crushing.

Because FHWA discretion for the project is expected to cease once the project is completed (R. Yedlin, FHWA, pers. com), we are unable to evaluate the fatality risk a new roadway and high-speed vehicle travel poses to gartersnakes (see Cumulative Effects).

To summarize, we anticipate adverse effects of the proposed action can include harassment, displacement, injuries, and fatalities to gartersnakes from elevated disturbance levels and heavy machinery operations for the life of the project. Snakes may be injured or killed in their shelters, on the surface, or anywhere surface disturbances occur at any time during the project. In addition, displacement of snakes during the project will increase their vulnerability to predators and to exposure at a time when vegetation removal has reduced escape and thermal cover.

### Sedimentation Effects

We anticipate construction standards and BMPs will help to minimize erosion and downstream sedimentation effects to gartersnakes and their prey through erosion control measures and post-construction rehabilitation of disturbed areas. Given that the action agency fully implements erosion controls and other conservation measures, erosion and sedimentation effects downstream of the construction footprint will be minimized, localized, and temporary. The amount of sediment expected to enter the Verde River as a result of the proposed action should be minimized due to BMPs, and as a result, would be a small amount above the existing baseline and subside quickly following the project. Thus, we anticipate increased sedimentation will have an insignificant effect to the gartersnake, its prey, and its habitat.

### Water Quality Effects

We anticipate conservation measures and BMPs implementing spill and storm water protection plans and equipment use restrictions will prevent or minimize effects to stream water quality and the gartersnake and its habitat. Under optimal (i.e., dry) conditions, any impacts to water quality due to chemical releases are likely to be minimal or nonexistent. Unforeseen large storm events that result in surface flows through the action area during construction, or an accidental spill of a contaminant, such as concrete, concrete curing agents and sealers, vehicle lubricants, and other chemicals, have the potential to adversely affect water quality. An ACOE Clean Water Act Section 404 permit will be required for the project and will include provisions for immediate cleanup of any substance in case of a leakage or spill, and will describe treatment for each substance. Due to BMPs and conservation measures, 404 permit standards, and project timing, we expect any water quality effects to the gartersnake's aquatic habitat will be insignificant and discountable.

### Effects to Northern Mexican Gartersnake Critical Habitat

*PBFs 1-2 (Perennial or spatially intermittent streams that provide both aquatic and terrestrial habitat; hydrologic processes that maintain aquatic and terrestrial habitat)*

The proposed action will involve no instream work or physical alteration of the river's active channel or banks, and will have no effect on perennial flows, the river gradient, or flood cycles. Turbidity in the main river channel may increase during the project, but will be temporary and will cease with completion of the project. BMPs and conservation measures will minimize sedimentation effects.

Grading and contouring the Verde River floodplain and removing vegetation will temporarily and in some cases permanently eliminate gartersnake habitat, causing an adverse effect to proposed gartersnake critical habitat. For example, excavating earthen berms for flood protection prior to bridge construction will require removal of all vegetation along the berms, including shoreline vegetation where berms come within 10-20 feet of the riverbank. Overall, we estimate the project will affect up to 2 acres of the 2.7 acres of floodplain habitat in the construction footprint. However, except for the small amount of vegetation that will be lost permanently to bridge piers on the floodplain ( $\leq 0.007$  acre), and to long-term changes in vegetation inside the bridge's permanent footprint (1.2 acre), planned rehabilitation and

rehabilitation efforts will help to return most affected areas to as near their original condition as possible after construction.

Construction activities that may affect gartersnake critical habitat away from the Verde River's main channel include construction of the bridge piers, abutments and wingwalls, and paving of the bridge approaches. These structures will permanently alter approximately 0.25 acre of the approximate 1.9 acres of upland habitats in the construction footprint. The westernmost pier and the west bridge abutments and wing walls will be built on steep rocky slopes that form the west wall of the Verde River Canyon (Figure 3). These rocky slopes may provide gartersnakes with off-channel brumation habitat.

*PBFs 3-4 (Native Prey Base, Absence of Nonnative Aquatic Species)*

Based upon the types of work, conservation measures to minimize effects to the Verde River, and narrow bridge footprint, we do not anticipate the project can influence the gartersnake's aquatic species composition, distribution, or abundance.

## **CUMULATIVE EFFECTS**

Cumulative effects are those effects of future State or private activities, not involving federal activities, that are reasonably certain to occur within the action area considered in this biological opinion (50 CFR 402.02).

Much of the Verde Connect bridge, bridge approaches, and roadway footprint will occur on USFS land, therefore opportunities are limited for future non-federal actions within the action area.

However, long-term impacts can be expected to include increased urbanization within private or ASLD areas in the Verde Connect action area or surrounding areas that may affect the action area. We can anticipate increased recreation and trash deposition, habitat fragmentation, fire risk, spread of invasive species, and contamination of surface and groundwater. In addition, increased urbanization and development may increase use of both surface and groundwater in the Verde River drainage and ultimately could reduce flows in the Verde River. Vehicle use along the new roadway and bridge within gartersnake habitat may lead to gartersnake fatalities. Increased public access and use of the area may also lead to human-caused snake fatalities due to a prevalent fear of snakes (Ophidiophobia). Future management of the Verde Connect Bridge is likely to require vegetation removal or trimming and possibly removal of debris around the piers or abutments, which collectively can affect flycatchers, cuckoos, and gartersnakes.

## **JEOPARDY AND ADVERSE MODIFICATION ANALYSIS**

Section 7(a)(2) of the ESA requires that federal agencies ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat.

### **Jeopardy Analysis Framework**

Our jeopardy analysis relies on the following:

“Jeopardize the continued existence of” means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR 402.02). The following analysis relies on four components: (1) Status of the Species, which evaluates the range-wide condition of the listed species addressed, the factors responsible for that condition, and the species’ survival and recovery needs; (2) Environmental Baseline, which evaluates the condition of the species in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the species; (3) Effects of the Action (including those from conservation measures), which determines the direct and indirect impacts of the proposed federal action and the effects of any interrelated or interdependent activities on the species; and (4) Cumulative Effects, which evaluates the effects of future, non-federal activities in the action area on the species. The jeopardy analysis in this biological opinion emphasizes the range-wide survival and recovery needs of the listed species and the role of the action area in providing for those needs. We evaluate the significance of the proposed Federal action within this context, taken together with cumulative effects, for making the jeopardy determination.

## CONCLUSIONS

After reviewing the current status of the flycatcher, cuckoo, and northern Mexican gartersnake in the action area, the environmental baseline for the action area, the effects of the proposed Verde Connect action, and cumulative effects, it is our biological and conference opinion that the proposed action is not likely to jeopardize the continued existence of the flycatcher, cuckoo, or gartersnake or destroy or adversely modify designated flycatcher critical habitat or proposed cuckoo or gartersnake critical habitat. We base these conclusions on the following reasons:

### **Southwestern Willow Flycatcher and Designated Critical Habitat and Western Yellow-Billed Cuckoo Proposed Critical Habitat**

- We anticipate flycatcher and cuckoo nesting pairs will be harassed by construction over a single breeding season. We do not anticipate any fatalities to breeding flycatchers or cuckoos, but can expect reduced productivity. Based upon these two bird’s distribution across multiple states and occurrence elsewhere along the Verde River and throughout Arizona, this single year’s productivity loss will not have noticeable short-term or long-term effects to local or broader flycatcher or cuckoo populations, distribution, or abundance.
- Migrating and dispersing flycatchers and cuckoo behavior may be altered by construction, but it will be of short duration and birds will have foraging and sheltering habitat available nearby.
- The new bridge will have a temporal effect and permanently fragment flycatcher/cuckoo habitat and designated/proposed critical habitat. We anticipate insect prey species will be reduced temporarily from habitat removal. The bridge and construction design may alter river dynamics and possibly riparian habitat quality in the immediate area that extends a short distance upstream or downstream from the bridge. Because of the bridge’s

relatively small footprint and its orientation perpendicular to the river, the effect is minimized, and will not prevent continued river flow and habitat development farther upstream and downstream allowing critical habitat to remain functional for flycatcher and cuckoo conservation and recovery.

### **Northern Mexican Gartersnake and Proposed Critical Habitat**

- We anticipate human activity and heavy machinery required for project construction will incidentally take (harass, injure, kill) northern Mexican gartersnakes. Conservation measure implementation, a relatively small action area, and finite project length (1-1.5 years) is expected to minimize the degree of effect to snakes. Because gartersnake distribution is reliably detected across various Arizona streams, and is known to occur in New Mexico and Mexico, the effect from this project is not anticipated to result in local or broader population effects.
- We anticipate temporary adverse effects to northern Mexican gartersnake proposed critical habitat PBF 1 and 2 (aquatic or riparian habitat, adequate terrestrial space) and permanent changes to terrestrial space from bridge piers, abutments, wingwalls, and roadways. The overall small construction footprint within gartersnake proposed critical habitat limits the extent of the effects. These temporary and permanent alterations to gartersnake habitat are a small portion of the overall 27,784 acres of proposed northern Mexican gartersnake critical habitat. Therefore, we expect proposed northern Mexican gartersnake critical habitat will remain functional for gartersnake conservation and recovery.

### **INCIDENTAL TAKE STATEMENT**

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. “Take” is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. “Harm” is defined (50 FR 17.3) to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined (50 FR 17.3) as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. “Incidental take” is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

## **AMOUNT OR EXTENT OF TAKE**

### **Southwestern Willow Flycatcher**

We anticipate incidental take of southwestern willow flycatchers as a result of the proposed action. The incidental take is expected to occur during the 2022 breeding season in the form of harassment, causing displacement, reduced productivity, and possibly reduced survivorship as a result of noise and increased activity from construction activities. Because the flycatcher territory abundance is variable from one season to the next, we are unable to anticipate exactly how many territories will be affected. Therefore, we anticipate that all flycatcher territories and their associated breeding attempts (including eggs and nestlings) within about 0.25 mi radius of the construction footprint will be incidentally taken, and estimate, based upon flycatcher survey results in 2019, this may be 1 or 2 territories. Because we anticipate all flycatcher territories and breeding attempts within this radius will be incidentally taken due to harassment, the extent of incidental take cannot be exceeded.

### **Western Yellow-billed Cuckoo**

We anticipate incidental take of western yellow-billed cuckoos as a result of the proposed action. The incidental take is expected to occur during the 2022 breeding season in the form of harassment, causing displacement, reduced productivity, and possibly reduced survivorship as a result of noise and increased activity levels during construction. Because cuckoo territory abundance can be variable from one season to the next, we are unable to anticipate exactly how many territories will be affected. Therefore, we anticipate that all cuckoo territories and their associated breeding attempts (including eggs and nestlings) within a 0.25 mi radius of the project footprint will be incidentally taken, and estimate, based upon survey results in 2019, and typical territory size, this may be 1 or 2 territories. Because we anticipate all cuckoo territories and breeding attempts within this radius will be incidentally taken due to harassment, the extent of incidental take cannot be exceeded.

### **Northern Mexican Gartersnake**

We anticipate the proposed action is reasonably certain to result in incidental take of northern Mexican gartersnakes. Incidental take is expected to be in the form of harm (direct injury or fatality) and harassment resulting from heavy equipment operations (e.g., crushing), and other related construction project activities. Incidental take of snakes will occur if they are crushed in their dens or retreats or if they are killed or injured by heavy equipment while on the surface. Snakes killed on the surface may be detected. Those killed belowground are not likely to be detected.

It is difficult to estimate the number of gartersnakes incidentally taken because they are small, camouflaged, secretive, and can be taken underground or in areas where they cannot be easily detected.

We examined Emmons and Nowak (2016) who detected over 100 northern Mexican gartersnakes in the 124-acre CVRP, 6 miles downstream of the Verde Connect bridge during their three-year study.



To establish a population size for the extent of gartersnake take, we used the 100 snakes documented in the CVRP as the baseline for the Verde Connect action area. Habitat conditions in the two areas are similar and they are similar in size—136 acres and 117 acres, respectively. Thus, taking into account the project footprint's size, that some snakes killed or injured will not be detected, and project effects will occur mostly over one to two seasons, we will consider the amount or extent of take to be three (3) individual gartersnakes (3 percent) found injured or dead as a result of the project.

## **EFFECT OF THE TAKE**

In this biological opinion, we have determined that the level of anticipated take is not likely to result in jeopardy to the yellow-billed cuckoo, southwestern willow flycatcher, or northern Mexican gartersnake, or destruction or adverse modification of proposed northern Mexican gartersnake proposed yellow-billed cuckoo, or designated southwestern willow flycatcher critical habitat.

## **REASONABLE AND PRUDENT MEASURES AND TERMS AND CONDITIONS**

The conservation measures included in the proposed action are appropriate to minimize take of the flycatcher, cuckoo, and gartersnake. However, we are including monitoring and reporting requirements as a reasonable and prudent measure to document any take that occurs. In order to be exempt from the prohibitions of section 9 of the Act, FHWA must comply with the following terms and conditions, which implement reasonable and prudent measure and outline reporting and monitoring requirements. These terms and conditions are non-discretionary.

1. FHWA shall monitor incidental take resulting from the proposed action and report to the FWS the findings of that monitoring.
  - a) FHWA (or its designated party) will monitor areas that could be affected by the proposed action to ascertain incidental take of individual flycatchers, cuckoos, and gartersnakes.
  - b) FHWA shall submit a monitoring report to the Arizona Ecological Services Field Office within 90 days after completion of the project. This report will briefly document implementation of conservation measures, the number of northern Mexican gartersnakes encountered, including those captured and relocated, and gartersnake injuries and fatalities that occurred.
  - c) FHWA (or its designated party) shall contact the Arizona Ecological Services whenever northern Mexican gartersnakes are incidentally taken to discuss the events and determine whether additional conservation measures are needed.

## **Disposition of Dead or Injured Listed Species**

Upon locating a dead, injured, or sick listed species, initial notification must be made to the U.S. Fish and Wildlife Service, Office of Law Enforcement, (Resident Agent in Charge), 4901 Paseo

del Norte NE, Suite D, Albuquerque, New Mexico, 87113, telephone: 505/248-7889, within three working days of its finding. Written notification must be made within five calendar days and include the date, time, and location of the animal, a photograph if possible, and any other pertinent information. The notification shall be sent to the Office of Law Enforcement, with a copy to this office. Care must be taken in handling sick or injured animals, to ensure effective treatment and care, and in handling dead specimens to preserve the biological material in the best possible state.

### **CONSERVATION RECOMMENDATIONS**

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

1. We recommend Hoag (2007) and Arizona Department of Transportation (2018a) as aids in developing a revegetation plan for the Verde Connect bridge project. Hoag (2007) provides guidelines for willow and cottonwood plantings in riparian restoration efforts. The ADOT reference is a revegetation plan developed for a bridge retrofit project at the I-17/Verde River bridges approximately 6 miles downstream of the proposed Verde Connect Bridge. The revegetation plan will also benefit from a consideration of riparian vegetation lost during the project. These data will be available from the pre-construction inventory of riparian woodlands marked for removal, including individual trees, as specified under the conservation measures. The inventory will provide a “snapshot” of vegetation in the floodplain before construction, and ultimately will allow the best possible match between the original site condition and the restored condition. Pole plantings will require advance planning to synchronize the restoration schedule with schedules for locating, harvesting, and planting the cuttings. Timing is essential because workers must harvest and plant poles when trees are dormant, during late fall and winter, and a source for harvesting pole cuttings will need to be identified in advance. Depending on the landowner or land administrator involved, a special use permit may be required. Planners must consider replacement rates, the number of cuttings needed, and other parameters such as pole size at harvest (diameter and length), planting depth, and spacing between poles, all of which should be outlined in the revegetation plan.
2. We recommend using the ADOT gartersnake monitoring and relocation protocol for the I-17 bridges project (ADOT 2018b) as an aid in developing the gartersnake protocol for this project.

### **REINITIATION NOTICE**

This concludes formal consultation/conference on the actions outlined in your consultation request. You may ask us to confirm the conference opinion as a biological opinion issued through formal consultation if the proposed cuckoo or northern Mexican gartersnake critical habitat is designated. The request must be in writing. If we review the proposed action and find there have been no significant changes in the action as planned or in the information used during

the conference, we will confirm the conference opinion as the biological opinion for the project and no further section 7 consultation will be necessary.

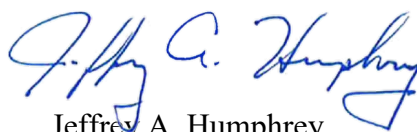
As provided in 50 FR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

Certain project activities may also affect species protected under the Migratory Bird Treaty Act (MBTA) of 1918, as amended (16 U.S.C. sec. 703-712) and/or bald and golden eagles protected under the Bald and Golden Eagle Protection Act (Eagle Act). The MBTA prohibits the intentional taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when authorized by the FWS. The Eagle Act prohibits anyone, without a FWS permit, from taking (including disturbing) eagles, and including their parts, nests, or eggs. If you think migratory birds and/or eagles will be affected by this project, we recommend seeking our Technical Assistance to identify available conservation measures that you may be able to incorporate into your project.

For more information regarding the MBTA and Eagle Act, please visit the following websites. More information on the MBTA and available permits can be retrieved from [FWS Migratory Bird Program web page](#) and [FWS Permits Application Forms](#). For information on protections for bald eagles, please refer to the FWS's National Bald Eagle Management Guidelines (72 FR 31156) and regulatory definition of the term "disturb" (72 FR 31132) published in the Federal Register on June 5, 2007, as well at the Conservation Assessment and Strategy for the Bald Eagle in Arizona ([Southwestern Bald Eagle Management Committee website](#)). The FWS appreciates efforts by the FHWA to identify and minimize effects to listed species from this project. We encourage you to coordinate the review of this project with AGFD. We also appreciate your ongoing coordination during implementation of this program. In keeping with our trust responsibilities to American Indian Tribes, we are providing copies of this biological and conference opinion to the Bureau of Indian Affairs and are notifying affected Tribes.

For further information, please contact Robert Lehman (602) 889-5950 or Greg Beatty (602) 889-5941. In all future correspondence on this project, please refer to consultation number 02EAAZ00-2019-F-1018.

Sincerely,

A handwritten signature in blue ink, appearing to read "Jeffrey A. Humphrey".

Jeffrey A. Humphrey  
Field Supervisor

cc: (electronic)

Fish and Wildlife Biologists, U.S. Fish and Wildlife Service, Phoenix, Flagstaff and Tucson,  
AZ (Attn: G. Beatty, S. Hedwall, J. Servoss, S. Sferra, J. Gwinn, M. Richardson)  
Chief, Habitat Branch, Arizona Game and Fish Department, Phoenix, AZ  
Supervisor, Region 2, Arizona Game and Fish Department, Flagstaff, AZ  
Biologist, Red Rock Ranger District, Coconino National Forest, AZ (Attn: Janie Agygos)  
Biologist, Prescott National Forest, Chino Valley, AZ  
Environmental Coordinator, Bureau of Indian Affairs, Phoenix, AZ (Attn: Chip Lewis)  
Yavapai Culture Director, Yavapai-Apache Nation, Camp Verde, AZ  
Director, Culture Research Department, Yavapai-Prescott Indian Tribe, Prescott, AZ  
Director, Cultural Resource Department, Tonto Apache Tribe, Payson, AZ  
Supervisor, Traditional Cultural Program, Navajo Nation, Window Rock, AZ  
Executive Director, Inter-Tribal Council of Arizona

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## **APPENDIX A: CONCURRENCES**

In this appendix, we provide our concurrences for your “may affect, not likely to adversely affect” determinations for the endangered razorback sucker, spinedace, and loach minnow, and their designated critical habitats. Conservation measures found in the proposed action include BMPs designed to minimize negative effects to soils and water quality during bridge construction. We incorporated these measures herein by reference.

### **Razorback Sucker and Designated Critical Habitat**

The razorback sucker once ranged throughout much of the Verde River and persisted near Peck’s Lake until 1954 (Minckley 1973). Since 1981, razorback suckers have been stocked at numerous locations on the Coconino National Forest, including the Verde River below Camp Verde, at Fossil Creek, Oak Creek, West Clear Creek, Cherry Creek, and Grindstone Wash. No recruitment has been documented at any of these locations.

A 2018 AGFD fish survey of the Middle Verde River from Tuzigoot Bridge, near Clarkdale to Beasley Flats, below Camp Verde found no razorback suckers (AGFD 2018). The most recent capture of razorback suckers on the Verde River included two individuals captured in 2012 near Beasley Flat (Greg Cummins, AGFD, pers. comm. 2019). AGFD considers the occurrence of razorback suckers within the action area of the Verde Connect project to be unlikely (Matt Chmiel, AGFD, pers. comm., 2019).

Critical habitat for the razorback sucker was designated on March 21, 1994 (59 FR 13374) and includes the Verde River and its 100-year floodplain from the Prescott National Forest boundary near Paulden downstream to Horseshoe Dam. The construction footprint contains 2.6 acres of razorback sucker designated critical habitat. PCE’s of critical habitat include (1) water; (2) physical habitat; and (3) biological environment.

We concur with your “may affect, but is not likely to adversely affect” determination for the razorback sucker and its designated critical habitat for the following reasons:

1. We anticipate that razorback suckers are rare within the action area, and unlikely to occur during the proposed bridge construction project. Thus, the likelihood of adverse effects (injuries or fatalities) to the razorback sucker from the project is discountable.
2. Conservation measures and BMPs will minimize the effects of turbidity and the risk of an accidental release of contaminants into the Verde River floodplain or channel. Any effect to razorback habitat from this project is likely to be minor, temporary and localized, and therefore insignificant.
3. Effects to razorback sucker critical habitat PCEs are expected to be insignificant because any effects to water, physical habitat or the biological environment would be minimized due to the implementation of conservation measures, the temporary nature of construction, and the localized effect from the new bridge development.

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### **Spikedace and Designated Critical Habitat**

The spikedace was listed as threatened on July 1, 1986 (51 FR 73769) and reclassified as endangered on February 23, 2012 (77 FR 10810). In Arizona, the species is now common only in Aravaipa Creek. The Verde River is presumed occupied; however, the last confirmed detection occurred in 1999 near Perkinsville (July 25, 2002 e-mail from M. Brouder to M. Meding, AGFD). Therefore, if fish persist, they are likely rare. Recent, limited eDNA samples from the upper Verde River found no spikedace DNA (M. Richardson, USFWS, pers. comm.).

Critical habitat for the spikedace was designated in 1994, revised in 2000 and 2007, and finalized in 2012 when the species was uplisted as endangered (77 FR 10810). The Verde River Subbasin designated critical habitat unit extends 106 river miles from Sullivan Lake Dam downstream (past Verde Connect) to the confluence of Fossil Creek (77 FR 10810). The construction footprint and action area contain 6.8 acres of spikedace designated critical habitat. PCEs of designated spikedace critical habitat include 1) habitat for all life stages, 2) aquatic insect food base, 3) unpolluted streams, 4) perennial flows, 5) absence of nonnative aquatic species, and 6) unregulated flows that allow periodic flooding, or adequate function if regulated.

We concur with your “may affect, but is not likely to adversely affect” determination for the spikedace and its designated critical habitat for the following reasons:

- Spikedace are unlikely to occur in the Verde River; thus, any adverse effects are discountable.
- We expect project effects to spikedace habitat and critical habitat PCEs will be insignificant and discountable. Because there will be no Verde River water diversions or instream work, we anticipate no effects to perennial flows and flow frequency (PCEs 1, 4 and 6). Should the new bridge or its construction influence river channel morphology temporarily or permanently, the change is anticipated to small and limited to the bridge area, and as a result, insignificant. Conservation measures and BMPs will minimize stream sedimentation and contaminants so that the effect is likely insignificant and discountable (PCEs 2 and 3). Because of the restrictions working within the Verde River, the small area where the bridge occurs, and presence of exotic and native fish species, we expect the project will have no noticeable effect to fish species presence or abundance.

### **Loach Minnow and Designated Critical Habitat**

The loach minnow was listed as threatened in 1986, and reclassified as endangered on February 23, 2012 (77 FR 10810). We consider loach minnow extirpated from the Verde River. The loach minnow was last detected in the Verde River in the 1930s (M. Richardson, USFWS, pers.

comm.). AGFD documented no loach minnows during surveys of the Middle Verde River from Tuzigoot Bridge to Beasley flats in 2018 (AGFD 2018).

We designated critical habitat for the loach minnow on February 23, 2012 (77 FR 10809). The Verde River Subbasin critical habitat unit extends 73.6 miles from Sullivan Lake downstream past the Verde Connect project area to the confluence with Wet Beaver Creek. Critical habitat extends 300 feet laterally on each side of the river. The construction footprint and action area contains 6.8 acres of loach minnow designated critical habitat. The loach minnow critical habitat PCEs are nearly identical to those of the spikedace.

We concur with your “may affect, but is not likely to adversely affect” determination for the loach minnow and its designated critical habitat for the following reasons:

- Loach minnow are unlikely to occur in the Verde River; thus, any adverse effects are discountable.
- We expect project effects to loach minnow habitat and critical habitat PCEs will be insignificant and discountable. Because there will be no Verde River water diversions or instream work, we anticipate no effects to perennial flows and flow frequency (PCEs 1, 4 and 6). Should the new bridge or its construction influence river channel morphology temporarily or permanently, the change is anticipated to small and limited to the bridge area, and as a result, insignificant. Conservation measures and BMPs will minimize stream sedimentation and contaminants so that the effect is likely insignificant and discountable (PCEs 2 and 3). Because of the restrictions working within the Verde River, the small area where the bridge occurs, and presence of exotic and native fish species, we expect the project will have no noticeable effect to fish species presence or abundance.

#### Literature Cited

Arizona Game and Fish Department. 2018. Arizona Game and Fish Department Verde River: Tuzigoot-Beasley Flats fish survey report. Prepared for U.S. Fish and Wildlife Service, Arizona Ecological Services Office, Phoenix.

#### **Narrow-Headed Gartersnake**

No formal narrow-headed gartersnake surveys were done for this project. Narrow-headed gartersnakes have been documented on the Verde River in small numbers since at least 2001, but no records have occurred near the construction footprint. Narrow-headed gartersnake records have occurred along the Verde River at Mormon Pocket (Holycross et al. 2006), and near Fossil Creek (Hanna 2005, Holycross et al. 2006) and Prospect Point (Emmons et al. 2011; undated memo from I. Emmons, Northern Arizona University, to J. Servoss, USFWS). These detections were 8 to 15 years ago and at locations 20 to 35 miles from the project area. Emmons and Nowak (2016) did not capture or observe narrow-headed gartersnakes during surveys at seven upper Verde River sites from 2012 to 2015.

We concur with your determination that the proposed action “may affect, but is not likely to adversely affect” the narrow-headed gartersnake for the following reason:

- Based on the lack of records of the narrow-headed gartersnake within 20 miles of the construction footprint, and its occurrence appears to be rare along the Verde River, it is unlikely that this snake will occur in the project area. Therefore, because the narrow-headed gartersnake is unlikely to occur in the action area, we expect any adverse effects to it or its habitat will be insignificant and discountable.

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#### **Mexican Spotted Owl**

The project area contains riparian forest, which meets the definition of Mexican spotted owl recovery habitat. As defined in the Recovery Plan (USFWS 2012), recovery habitat is primarily ponderosa pine-Gambel oak, mixed-conifer, and riparian forest that either currently is, or has the potential for becoming, nest/roost habitat or does or could provide foraging, dispersal, or wintering habitats. The Verde River corridor provides for dispersal and wintering owl habitat and in November 2019, a private landowner reported a juvenile spotted owl roosting approximately two miles southeast of the proposed bridge crossing for several days (D. Gould, personal communication to R. Lehman and S. Hedwall, FWS, November 15, 2019).

We concur with your determination that the proposed action “may affect, but is not likely to adversely affect” the Mexican spotted owl for the following reasons:

- No known protected (nest/roost) Mexican spotted owl habitat occurs within 20 miles of the action area. Therefore, there will be no disturbance to breeding Mexican spotted owls.
- There is no designated Mexican spotted owl critical habitat within the project or action area. Therefore, there will be no effect to Mexican spotted owl critical habitat.
- The Verde River contains riparian recovery habitat that Mexican spotted owls can use for dispersal and/or wintering, and owls were reported near the action area in November



2019. The proposed action will result in disturbance and vegetation clearing within approximately four acres of the riparian area, of which up to about 1.2 acres would be permanently lost or modified. Workers will not remove trees greater than 24 inches dbh, unless absolutely necessary, and they will avoid the removal of trees greater than 12 inches dbh wherever possible. Therefore, because of the localized area of disturbance and minimized effects to trees, we think that the proposed action will not preclude this stretch of the Verde River from providing dispersal/wintering habitat for Mexican spotted owls. In addition, because Mexican spotted owls do not occupy this area year-round, but likely use it opportunistically for movement and winter foraging, the effects of the action on Mexican spotted wintering and dispersal habitat and their behavior will be insignificant.

#### Literature Cited

U.S. Fish and Wildlife Service (USFWS). 2012. Mexican spotted owl Recovery Plan, First Revision (*strix occidentalis lucida*). Southwest Region, Albuquerque, New Mexico.

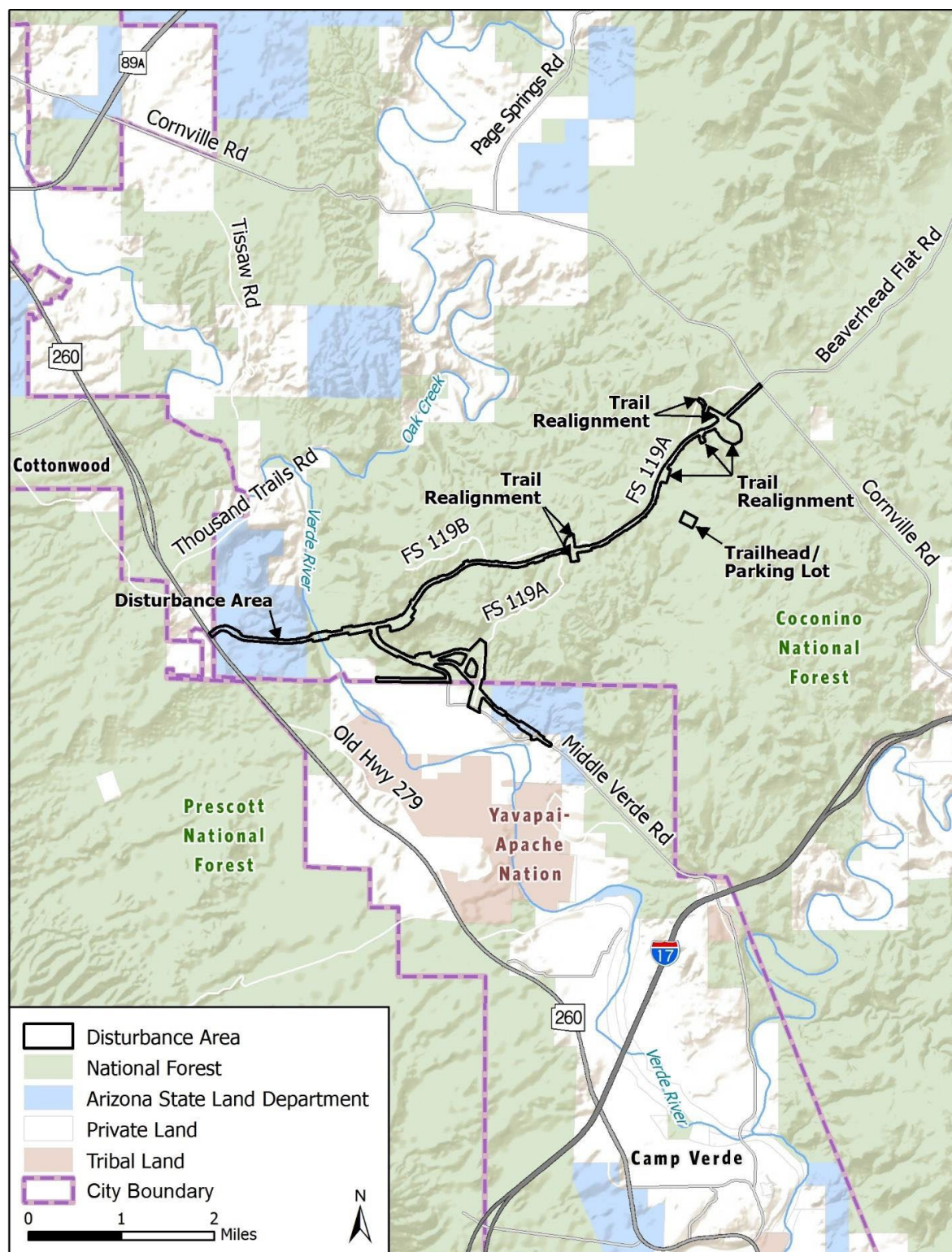


Figure 1. Vicinity map for the Verde Connect project showing landownership and the construction footprint (disturbance area). The bridge construction site is in the west-central part of the map where the construction footprint crosses the Verde River.

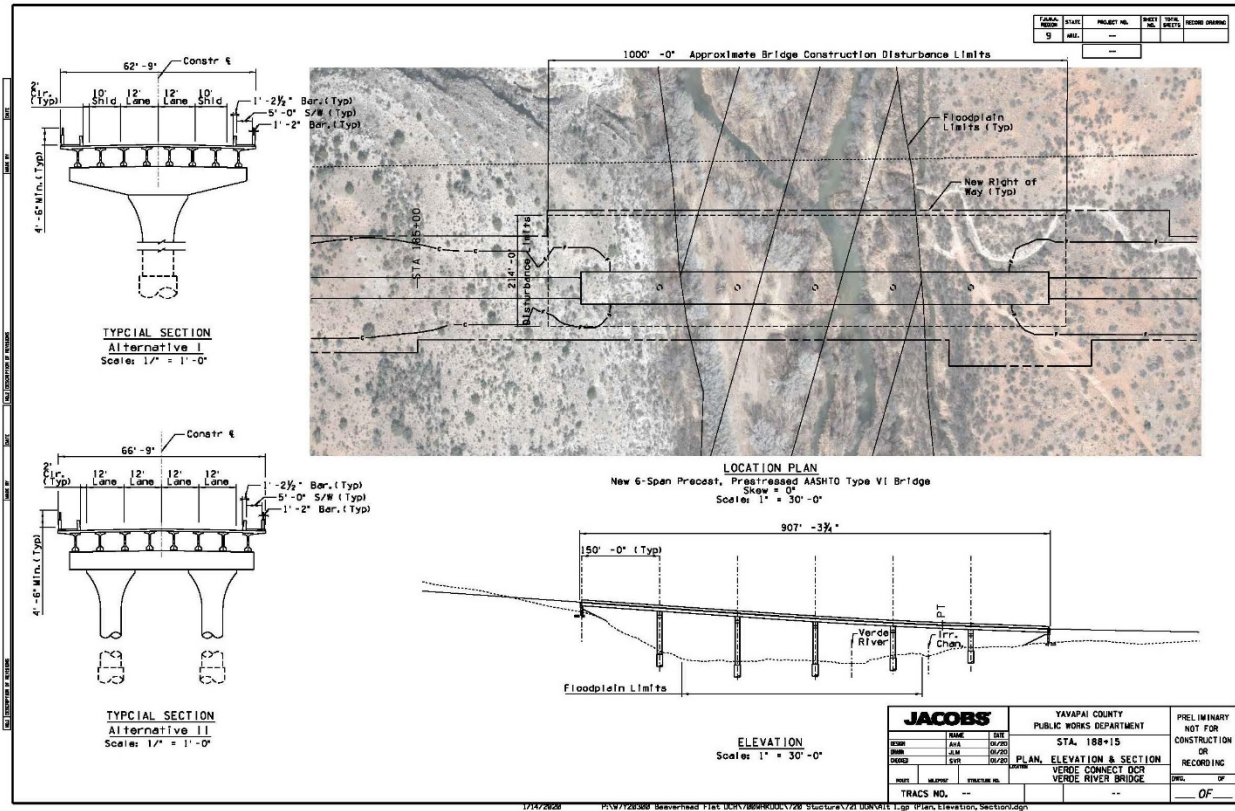


Figure 2. Engineering drawings of the new bridge, showing overhead and side views, and two possible pier designs (from page 6 of the BA). Note that the *disturbance limits* and *floodplain limits* in the figure are equivalent to the construction footprint and 100-year floodplain in the BO.





Figure 3. Oblique aerial view of the bridge construction site showing the 907-foot-long bridge centerline in red, the 500-foot-wide 100-year floodplain in blue, and earthen berms for flood protection in brown. The linear feature marking the eastern edge of the floodplain and riparian corridor is the OK Ditch, a historic irrigation canal that is still in use. Note the broad uniform galleries south of the centerline, patchier habitat north of the centerline, and the more open habitat at the bridge crossing. View is from the SSE to the NNW.



Figure 4. Close up view of the proposed bridge crossing. The centerline of the proposed alignment is shown in red. The position and configuration of earthen berms for flood protection in work areas are shown in green.